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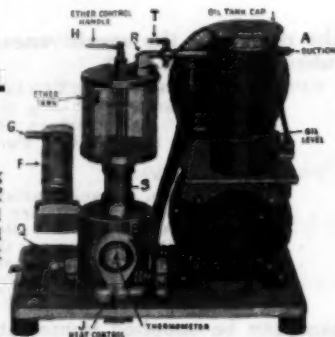
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Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	Page.	ABSTRACTS FROM MEDICAL LITERATURE—	Page.
Head Injuries, by K. B. Noad .. .	141	Ophthalmology .. .	154
Notes on the Radiography of Head Injuries, by E. W. Frecker .. .	144	Oto-Rhino-Laryngology .. .	154
Neurosurgical Sequelæ of Head Injuries, by W. Lister Reid .. .	146	BRITISH MEDICAL ASSOCIATION NEWS—	
Cerebral Concussion, by Gilbert Phillips .. .	148	Scientific .. .	156
REPORTS OF CASES—		CORRESPONDENCE—	
The Rapid Onset of Putrefaction in Dead Bodies, by J. B. Cleland, M.D. .. .	149	An Unusual Operative Finding .. .	157
REVIEWS—		The Annual Meeting of Delegates .. .	157
A Year Book on Neurology, Psychiatry and Endocrinology .. .	150	Commonwealth Powers, State Rights and the Federal Council .. .	157
LEADING ARTICLES—		OBITUARY—	
Education, Propaganda and the Press .. .	151	Richard Herbert Joseph Fetherston .. .	158
CURRENT COMMENT—		Percy Glover Cooley .. .	159
The Treatment of Tuberculous Pleural Effusion and Empyema .. .	152	Lawrence Ruth Forbes .. .	159
Penicillin .. .	153	Lewis Lofkovitz .. .	159
		Benjamin Gilmore Wilson .. .	160
		NOTICE .. .	160
		NOMINATIONS AND ELECTIONS .. .	160
		BOOKS RECEIVED .. .	160
		DIARY FOR THE MONTH .. .	160
		MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. .	160
		EDITORIAL NOTICES .. .	160

SUPPLEMENT NUMBER 22 ON WAR MEDICINE AND SURGERY:

Bacillary Dysentery.

HEAD INJURIES.¹

By K. B. NOAD,

Lieutenant-Colonel, Australian Army Medical Corps.

SOME six years ago, when I was secretary of the Section of Medicine of the New South Wales Branch of the British Medical Association, I arranged a similar symposium on head injuries. It is appropriate that the subject should be reviewed at this time, because gunshot wounds and their sequelæ have been added to the constantly high civilian injuries resulting chiefly from motor-car accidents. In other countries air-raid injuries have also swelled the number. Only a part of this large subject can be reviewed in the time at my disposal, so some results of experience at an army hospital and the army point of view will be mainly my theme tonight.

Head injury is most important to the army, because of the frequency with which it is followed by incapacity of personnel through physical or psychological sequelæ or both, and because it so frequently forms the basis of simulated incapacity.

For the twelve months ending April 30, 1943, roughly 22,000 patients were admitted to a large military hospital. Of these, some 200, or approximately 1%, were suffering from head injuries. With the exclusion of 60 battle casualties, the remainder were due to accident. Twenty-one had sustained a fracture of the skull, and 108 were recorded as suffering from concussion.

The fractures of the skull were all closed, and the patients' average stay in hospital was twenty-seven days.

¹ Part of a symposium on head injuries, read at a meeting of the New South Wales Branch of the British Medical Association on June 24, 1943.

One man died twenty-four hours after his admission; of the remaining twenty men, only four returned to duty after their stay in hospital. Six had to be discharged from the army and ten had to be sent to other institutions before the problem of their disposal could be settled.

Among these records of fractured skull was that of a case, not included here, of a man who had sustained a severe head injury some months before, in which a piece of bone had been driven into the cranial cavity and his right eye had been destroyed. He had been sent to a convalescent depot, and from there he was transferred to us in coma after several severe fits. Meningeal signs were strong; the cerebro-spinal fluid was turbid, and a pure culture of pneumococci was grown from it. He died in three days without regaining consciousness, despite intensive sulphonamide therapy.

These cases of delayed meningitis after frontal injuries are usually the result of infection of blood clot in the upper nasal passages or sinuses.

One of the patients included above was readmitted to hospital some months later, a potential suicide with depressive psychosis. His age was thirty-four years, and his post-traumatic amnesia was of at least twelve hours' duration. His condition improved sufficiently after "Cardiazol" therapy for him to be discharged from hospital and the army.

These are only a few cases; but they instance some of the complications and give an indication of the impaired efficiency resulting from severe head injury.

With regard to the patients suffering from concussion, the average stay in hospital was eighteen days; 30 men returned to duty, three were discharged from the army and 75 had to be transferred for further convalescence before a final decision was reached. Thus it will be seen that, even if a large proportion of the 75 men disposed of in other ways than return to duty finally do reach their units, a considerable loss of men and training has been the result of their injury.

Concussion.

The pathological results of injury to cerebral tissue are well known, and no further reference will be made to them with the exception of concussion. A good deal of confusion in the literature has existed as to what is meant by this term and its underlying pathological basis. Some have held that concussion, and even death, may be produced without evidence of cerebral damage. Many autopsies in cases of cerebral injury have failed to reveal lesions adequate to account for death. Other workers, notably Trotter, have insisted that some vascular mechanism—anaemia, hæmorrhage or œdema—is the explanation of the symptoms. There is now, I think, increased acceptance of the view that a disturbance of cerebral function may exist without hæmorrhage—that, though hæmorrhage may coexist, the symptoms are due mainly to abolition of neuronal function by the blow. The work of Brown and Russell on experimental concussion, which, they state, is directly comparable with clinical concussion in man, has led them to define this state as "a direct traumatic paralysis of nervous function without vascular lesion . . . the direct effect of physical stress on neurones". They have shown that movement of the head is the principal factor in the production of concussion, and that blows on the fixed head are not followed by concussion. This they have called "acceleration concussion". This may explain the absence of unconsciousness often seen after gunshot wounds of the head. I have known of men who have walked miles after being shot in the head.

Two men attacked a Japanese machine-gun post manned by a single remaining gunner. One man was riddled, and the second received a bullet in the right temple. In the act of falling he threw his rifle with bayonet attached, transfixing the Japanese soldier. He picked himself up and walked two miles to a post, where he received treatment.

In these cases the energy of the missile has been expended in perforating the skull, and movement of the head, comparable with that in street accidents, does not occur.

Clinical Examination.

One has frequently to approach the examination of a subject of head injury without most vital information concerning the nature of the accident and the presence or absence of unconsciousness after it. Thus a thorough scrutiny of the patient at both the first and subsequent examination must be made. If the patient is unconscious, an estimate of the degree of unconsciousness must be made, and the signs of cerebral damage, such as paresis, disturbance of tone or abnormality of reflexes, must be noted. Only in this way may subsequent alteration in the clinical picture be detected.

I wish now to refer briefly to three most important clinical points in the examination of subjects of acute head injuries—the pulse, the pupils and the pyramidal system.

The pulse is an important guide in the diagnosis of head injuries and their complications. The rapid, thready pulse associated with shock in the early stages is well known, as also is the falling pulse rate of increasing intracranial pressure. But bradycardia may not be a sign of increasing compression, and conversely, intracranial pressure may increase without a falling pulse rate. A slow pulse rate (40 to 50 per minute) may be found some days after head injury, but not accompanied by increasing stupor, rise of blood pressure or the other signs of compression. Similarly, the diagnosis of compression should not be denied because of the failure of the pulse rate to fall, provided other definite signs exist and the skin remains warm and dry. In deepening coma from brain concussion or contusion the pulse is rapid and the skin clammy. This evidence of falling circulation may also occur in the later stages of compression, and it signals the breakdown of the compensatory mechanism for maintenance of cerebral circulation.

After head injury the eyes may be seen to be incoordinate, as they sometimes are after anaesthesia. The pupils may be constricted, or they may react to light in paradoxical fashion. These phenomena are usually the

result of vascular disturbances in the mid-brain affecting the oculomotor nuclei. A fixed, dilated pupil may be the result of division of or pressure on the optic nerve, in which case the consensual reaction is maintained; but if this is absent a state of emergency exists, as the indication is that the uncus has been thrust down between the mid-brain and the edge of the tentorium. In this way the oculomotor nerve is involved and stretched. If this is not released by subtemporal decompression, death will inevitably occur. This type of pupil is often mentioned in descriptions of middle meningeal hæmorrhage; but it may not be present and may be late in onset in these cases.

Flaccidity of musculature with disappearance of reflexes follows initial injury to the brain with its abolition of neuronal function. This passes off after a variable period, and normal tone and reflexes return. When progressive compression of a hemisphere takes place, spasticity of the opposite limbs is the rule, to be followed later by flaccidity as anaemia of the cortical neurones ensues. If one side is found to be spastic and the other flaccid some hours after injury, it may be presumed that compression began in the hemisphere opposite to the flaccid limbs and that irritation has spread later to the opposite hemisphere with production of spasticity. If compression continues and the patient does not die, the second side should in its turn become flaccid.

The period of unconsciousness is proportional to the severity of injury. The degree of damage to the brain may be estimated also from the period of retrograde and post-traumatic amnesia present after consciousness has been regained. Post-traumatic amnesia has been suggested by Ritchie Russell as an estimate of the true period of unconsciousness. Retrograde amnesia is rarely for a longer period than a week, but in some cases may be for years, and gradually decreases until only a short period remains. To one such case I shall refer later.

Repeated examinations during convalescence are necessary in order to assess the progress of mental and physical recovery.

Prognosis.

In my experience the outlook in head injury depends primarily upon the stuff of which the man is made. If he is of good quality intellectually, morally and physically, good recovery may follow very severe head injuries; but such injuries may require a prolonged convalescence. Some patients, however, even good types of men, remain mental and physical wrecks after brain injury. Conversely, in the weaker vessels of poor nervous and physical quality, the sequelæ may be profound and incapacitating.

A soldier, aged thirty-six years, had never been a good scholar, and had left school at third class primary school standard. He was unmarried and lived with his spinster sister. In a motor-truck accident in March he sustained a compound depressed fracture of the skull in the left temporal region. Brain substance was present in the wound. Aphasia continued for a week after operation, when he began to say a few words. When he was reviewed in June, his memory was poor. He was irritable and sat about by himself. His expression was rather vacant, and he was mentally slow. He always hesitated before speaking, but answered sensibly. The psychiatrist estimated his mental age at ten years. Right lower facial weakness was present. Tremor of the face was noted, and he spoke in a slurred manner. The whole picture was reminiscent of *dementia paralytica*.

Deaths from head injury usually occur within the first twenty-four hours. If this period is survived, a hopeful prognosis may be given as to recovery.

Treatment.

Vigilance and masterly inactivity should characterize the medical care of a patient with an acute head injury. One should be ready to perform lumbar puncture, to institute dehydration measures and to operate if occasion arises; but otherwise the patients should be left alone. Dehydration methods, particularly those employing intravenous injection, are inadvisable in the early stages, as

cerebral oedema must rarely be a cause of dangerous intracranial pressure, and lumbar puncture with the taking of careful manometric readings will usually prove adequate in controlling the rise of cerebro-spinal fluid pressure, as well as in giving information on the intracranial conditions. Magnesium sulphate may be given *per rectum* in 50% solution if any dehydration is considered necessary. After the acute stages of a head injury are over and some degree of intracranial equilibrium has been established, dehydrants given intravenously, such as saline solution (15%), or glucose or sucrose in 25% or 50% solution, are valuable aids in lowering intracranial pressure.

Shock, the result of trauma to medullary centres, is treated by warmth and small transfusions of blood or serum if the blood pressure remains persistently low.

Cheerful encouragement must be given the patient after recovery of consciousness, and he may be allowed up for short periods as soon as his condition warrants it. This is most important in the case of soldiers, who consciously or unconsciously will develop functional symptoms. A long stay in bed carries a sinister suggestion of severe illness and is a fertile source of anxiety symptoms. If there is no contraindication, the patient is allowed up gradually a week after recovery of full consciousness and four or five days after the disappearance of headache if he has not been unconscious. Patients are sent to convalescent homes, then to rehabilitation centres, and returned to their units as soon as their condition allows. If his original injury has been severe, the soldier is reclassified in order to limit his duty for a period to service out of the front line. We have found that only a small percentage of the men with more severe head injuries have been able to return to duty in their original category.

In dealing with the psychological and functional sequelae of head injury, a careful history of the present complaint is taken and considered against the background of the patient's age, previous history and qualities, and the severity of the injury, particularly with reference to the duration of retrograde and post-traumatic amnesia. With this information and a careful physical examination, a fairly accurate estimate of symptoms can be made and the case dealt with on its merits.

Reports of Cases.

I wish to refer to a few cases encountered recently in army hospitals, which demonstrate some organic sequelae.

The first case is that of a man, aged forty-three years, who was admitted to a country hospital after an accident in October, 1942. He was unconscious, and the tongue, the left ear and temporal region and the right orbital region and cheek had been lacerated. He was transferred to a military hospital a fortnight later. On his admission, he was restless, mentally deranged and incontinent of urine and faeces. No obvious paralysis was present. There were healed lacerations of the left temporal region; the right abdominal reflexes were absent and the right plantar reflex was extensor in type. The cerebro-spinal fluid was under only slightly increased pressure and contained 70 milligrammes of protein *per centum*. After several intravenous injections of sucrose the patient was quieter and continent, obeying commands after a fashion. A burr hole was made in the left frontal region and a loculus of xanthochromic fluid was evacuated. The brain, which was about an inch from the dura, rose and began to pulsate normally. Following this a dramatic improvement took place. He became lucid and cooperative, and his general condition, which had deteriorated considerably, also improved. He could not remember his long period of army service at all or any of his friends; but gradually his memory returned. When he was reviewed three months later he felt well and had no headache. He had not regained his "punch" and was a little vague mentally. He tired easily, and his memory was faulty. His retrograde amnesia was still of considerable extent.

The second case is that of a man, aged thirty years. He had been in a motor-car accident in Syria in July, 1942; he had no memory of the accident, and he had post-traumatic amnesia of at least three days' duration. Haemorrhage from the right ear and haematoma of both eyes were present, and on lumbar puncture bright blood was obtained under pressure.

An X-ray examination revealed "a branching fracture of both frontal bones going into the base with wide separation of fracture edges in the left frontal region". Rhinorrhoea persisted intermittently for six months.

Nine months later he still complained of left frontal headache, insomnia, complete anosmia and numbness of his upper teeth. His intelligence was distinctly below the average, and he was depressed and introspective. Fracture separation could still be felt in the left frontal region. Bilateral anosmia was present. Impairment of sensation over the second division of the fifth nerve on the left side was present.

Anosmia probably occurs more frequently than is realized, especially in frontal injuries. Testing of olfactory sense is often omitted from routine examination. This disability is seen most commonly in frontal injuries and is produced most probably by tearing of olfactory nerve filaments in movement of the brain. If anosmia persists for longer than a few weeks, it is usually permanent.

The third case is that of a soldier, aged twenty-five years, who sustained a motor-cycle accident in January, 1943. He was taken to a civil hospital, where he had a severe generalized epileptiform seizure. He was transferred to a service hospital, where he was violently resistive on admission. Haematoma of both eyes and a depressed fracture of the left frontal bone and anterior wall of the left frontal sinus were present. The depression was raised. He was semi-conscious for three days, and for five days there was a copious flow of blood-stained cerebro-spinal fluid from his nose.

Three weeks after his admission to hospital he complained of blurring of his vision, and examination of his visual fields revealed concentric contraction, particularly on the right side. When his condition was reviewed three months after the accident, his retrograde amnesia was still of some days' duration. He complained of giddiness, of intolerance of noise, of very defective memory, and of blurring and dimness of vision. His general condition was good. There was anaesthesia of the left frontal region. The right optic disk was china white in colour and the left one was pale. Examination of the fields revealed constriction of the right field, with scotoma of the nasal half; slight constriction of the left field was found.

The presence of rhinorrhoea after a head injury indicates a communication with the subarachnoid space, and some neurosurgeons advise an immediate craniotomy for repair of the rent in the dura. I prefer to institute sulphonamide therapy and wait, for many such rents close spontaneously. Elevation of depressed bone, if it can be restored, often produces an arrest of rhinorrhoea. If leakage persists over weeks, operation must be undertaken for closure of the fistula.

Injury to the optic nerve is rather infrequent, the incidence in published series varying between 0.5% and 1.3%. Strangely enough, three cases occurred in this small series. The actual cause of optic atrophy is uncertain. Compression of the nerve by blood in the sheath, tearing of small arterioles supplying the nerve and concussion of the nerve are theories that have been advanced.

The fourth case is that of a non-commissioned officer, aged thirty-two years, who was admitted to a civil hospital with lacerations of the scalp in the left parieto-occipital region. There was blood in the cerebro-spinal fluid, and X-ray examination revealed widening of the parieto-occipital suture. The oculomotor nerve on the right side and both abductors were weak, and bilateral papilloedema was present. About six weeks later the right optic disk was slightly pale and the retinal arteries were thinner. There were still some ptosis of the right upper lid and weakness of the left sixth nerve. His previous health had always been good, and he was always fit.

On review four months after the accident, his retrograde amnesia was still of over five weeks' duration; post-traumatic amnesia was uncertain. He was extremely emotional and unable to control himself; he said: "Everything surges up and I burst out crying. I can't bear people and want to be away by myself." Libido was lost completely. He also complained of loss of taste and smell—"I can't tell the difference between oyster Mornay and cold corned beef"; but he could taste salt, sweet and sour. He complained of diplopia, with the false image above and to the right of the true image. His face was immobile, with a constant frown. Ptosis of the right upper lid and a

slight internal strabismus of the right eye were present. The right disk was pale, with thin arteries. Though he was able to feel light touch everywhere, pin-prick was appreciated as such only on the chin and the left infra-orbital region. He could not smell anything—not even *Liquor Ammonii Fortis* held to his nose. The last-mentioned is appreciated through the fifth nerve. The deep reflexes of the left side were increased and the left plantar response was indeterminate, the right being flexor in type. There was extensive sensory loss on trunk and limbs. He walked well on rather a wide base, but with the left eye closed he veered strongly to the left.

This is an instance of the damaging effect of a severe head injury on a good type of man. Considerable recovery may still be expected. The ocular palsy has improved, and further improvement may yet occur.

The next case is that of a young man, aged twenty-one years. He was discharged from hospital with the diagnosis of functional dyspepsia. That night he suffered from severe pain in the right testicle of sudden onset; he collapsed in the street and became unconscious. He was readmitted to hospital. Meningeal signs were present; lumbar puncture revealed pure blood in the cerebro-spinal fluid. A small extravasation appeared in the left upper lid, and swelling appeared beneath the left temporal muscle. Sixth nerve palsy developed. X-ray examination revealed a linear fracture of the left temporal region.

The interest in this case lies in the manner of onset, and in the possibility that the sequence of events was a rupture of an intracranial aneurysm as the cause of the collapse and unconsciousness and blood in the cerebro-spinal fluid, with the fracture of the skull as a result of the fall. Admittedly, the initial symptom of testicular pain is most unusual. Like most oculomotor palsies, the sixth nerve paralysis here cleared up completely.

The sixth case is that of a man, aged thirty-two years, who has no idea what happened to him. He was admitted to hospital on May 30, 1943. His total period of amnesia extends from May 26, 1943, to June 7, 1943; his retrograde amnesia is probably of two or three days' duration.

On his admission to hospital he was drowsy, cooperative and quiet. There was a bruise above and behind the right mastoid, and a right peripheral facial weakness was apparent. He was almost completely aphasic, presumably from *contre coup* injury, as he was right-handed. His cerebro-spinal fluid was blood-stained, but not under pressure. An X-ray examination revealed an L-shaped fracture extending up from the right petrous temporal bone across the squamous portion to the lower border of the right parietal bone.

His facial weakness and aphasia have disappeared almost completely; he has been up for a fortnight and feels perfectly well.

This is a good example of *contre coup* injury, the mechanism of which has been ascribed to flinging of the brain against the pole of the skull opposite to that struck, or to continuation of the brain in the direction of movement after sudden arrest of the head by resistance. This produces a suction effect, which may result in damage to surface vessels. As in concussion, several writers have stressed the necessity for movement of the head in the production of *contre coup*.

The last case is that of a soldier, aged twenty-eight years, who was admitted to hospital deeply unconscious. He was said to have attempted to jump from a moving train to another passing in the opposite direction. Cerebral irritation was most pronounced. Both ears and the right occiput were lacerated, and there was fresh blood in the left auditory meatus. The eyes deviated to the left. As the patient was restless, light ether anaesthesia was induced, and on lumbar puncture xanthochromic fluid under a pressure of 700 millimetres was withdrawn. (This illustrates the effect of ether on cerebro-spinal fluid pressure.) An X-ray examination revealed a branching fissured fracture of the right and left petrous temporal regions.

This man is now stone deaf, with no bone or air conduction or reaction to cold caloric tests on either side. He lurches wildly when walking. He was a good type of fellow from all accounts; but these disabilities are producing great deterioration of personality.

In this case either the eighth nerves or the internal ears have been destroyed.

NOTES ON THE RADIOGRAPHY OF HEAD INJURIES.¹

By E. W. FRECKER,
Sydney.

For there is nothing covered, that shall not be revealed; and hid, that shall not be known.

MATTHEW x, 26.

RADIOLOGY generally has travelled far along a complex and difficult road since Röntgen first announced his discovery in 1895. In those early days the only body tissues which could be well seen were the bones, and consequently the interests of the radiologist then lay almost entirely in the skeleton.

The greatest advances from this first crude condition have been made by the use of opaque or contrasting media, which by various means can be inserted or made to enter into the body cavities. The lungs by their air content are ideally suited to X-ray examination—the air acting as a natural contrast to the body tissues; but where such good conditions do not exist, it becomes necessary to devise methods for the introduction of contrasting substances.

Opaque barium meals and enemata were an early introduction and are now in daily routine use by all radiologists. As a result, the radiologist has a good working knowledge of gastro-enterology. The iodine-bearing compounds—lipiodol for the bronchial tree, the spinal cord and nasal sinuses, tetralodophenolphthalein for the gall-bladder, and more recently substances of the "Uroselectan" class for the urinary tract—all have an important place in diagnosis. "Thorotrast" outlines spleen, liver and reticulo-endothelial system as well as depicting the vascular system. Pneumoperitoneum is an occasional resource in abdominal conditions, and air has even been used to outline the urinary passages. Lastly, air is now being introduced into the cranial cavity as a diagnostic measure—a process best called pneumocephalography.

We can thus distinguish two phases in radiological progress: first, the X-ray examination of the unaltered body, to which we may refer as plain radiography, and second, examination after the introduction of some contrasting substance (contrast radiography).

The second method is far more productive than the first and usually results in the visualization of any anatomical disturbance of the part under examination. The abnormality so detected must then be interpreted in terms of pathology, due consideration and weight being given to all the other known data about the patient. Usually the method is relatively so valuable to the diagnostician that the radiologist is willy-nilly thrown pell-mell into the midst of the clinical activity and cannot remain sequestered behind his laboratory walls. But please note that each incursion into a new field casts a fresh burden of necessary knowledge upon him, if he is to be a really clinical radiologist and not a mere objective technician. Properly developed and educated, the radiologist is today the ubiquitous specialist with the widest general information about medicine in most of its branches.

Until comparatively recently, however, his attacks upon the skull were confined to the demonstration of fractures and other changes in the bony cranium—plain radiography. True, some internal diseases of the brain impressed their history upon the cranial walls; but apart from trauma much of his work in the skull rather revealed changes due to general bodily disease—malignant disease, Paget's disease, hyperparathyroidism, syphilis, myeloma and so on. Intracranial tumour produces evidence of increased intracranial pressure on the inner table and the pituitary fossa, and more rarely local calcification or erosion may reveal the actual site of tumour formation; but usually information concerning the cranial contents obtained by this simple method is relatively meagre.

¹ Part of a symposium on head injuries, read at a meeting of the New South Wales Branch of the British Medical Association on June 24, 1943.

In 1918, however, Dandy rendered the ventricles visible to the X rays by injecting air into them, and in so doing he cast fresh and inspiring tasks on the radiologist—tasks for which, I am afraid, he was but ill prepared. The complex field of neurology had so long lain concealed from the X rays that the radiologist was caught lacking in those anatomical, physiological, pathological and clinical data so necessary for true interpretation. Education in these fundamentals is now the first task the radiologist must impose upon himself if he is to become proficient in these newer methods.

Neurology, assisted by the methods of pneumocephalography, has shown great advances in the diagnosis of intracranial tumours; but when we come to a consideration of post-traumatic changes as shown by the same methods, much is yet to be learned. Radiologists can obtain this fundamental education only if some of them are permitted to participate actively with the clinician, the neurosurgeon, the psychiatrist or neurologist, as the case may be, in these new fields of experience now opening out mainly in special clinics.

A radiologist is presumably included in this symposium in order that he may indicate briefly how his special method can assist in the diagnosis of head injuries. As we have seen, the question has two aspects—plain radiography, in which the skull is considered mainly as a bony box with invisible contents, and secondly, contrast radiography, in which the potential spaces inside the skull are rendered visible by the introduction of air.

Plain Radiography.

Plain radiography of the skull is a routine procedure in all head injuries, and it is of interest to consider what is achieved by this simple method.

The fracture itself is of minor importance beside the possible injury to the cranial contents, which are themselves translucent and invisible. In spite of this, the resultant information gained is of great value. The absence of any visible fracture does not entirely exclude the possibility that one is present, for it may be in the base of the skull and not directly visible. We can, of course, examine this part of the skull by X rays; but the position necessary is constrained and likely to cause cerebral congestion. It should not be used for patients with recent head injuries. Still less does an absence of evidence of fracture exclude injury to the cranial contents.

The demonstration of a fracture is positive evidence that violence has been applied to the skull, and it indicates the need for adequate supervision even in the absence of any disturbing symptoms. The extent and nature of the fracture give some notion of the degree of violence and of the possible associated brain injury. In addition, there is a localizing and lateralizing value which, though not absolute, may facilitate the interpretation of the patient's symptoms. A fissure passing across the meningeal artery may lead us early to anticipate meningeal hemorrhage. Involvement of the frontal sinuses or mastoid region leads us to look for a traumatic arocele, not only immediately, but also by the taking of films at intervals for some weeks after. In certain circumstances a fracture across the cribriform plate is an indication for immediate operation to repair the dural defect. Incidentally, the demonstration of infective changes in sinuses or mastoids warns us of the possibility of meningeal infection, though it must be realized that opacity in these regions is often due to hemorrhage rather than to infection.

The demonstration of the extent and degree of comminution is essential to decide whether the dura is perforated and thus to guide the surgeon in his decision to operate.

Rarely, when the pineal gland or the *fals cerebri* is calcified, its deviation from the normal median position may indicate a cranial hemorrhage, abscess or tumour. A space-filling lesion will push the calcification to the opposite side; but conversely, gliosis or post-traumatic atrophy will pull it towards the side of the lesion.

Technique.

The X-ray examination of the skull is technically difficult. It needs care, adequate immobilization and (for the best results) some cooperation from the patient. It is probable that every patient who has been rendered unconscious by trauma should have his head examined, and even though the great majority of examinations produce negative results, yet every now and again a life will be saved by the detection of unsuspected injury. The confused, restless patient is a real problem, and it is doubtful whether examinations with portable bedside machines are really worth while in such circumstances. The power of the usual portable machine is limited, and the time of exposure is too long to secure sharp films showing no trace of movement. Furthermore, the Potter-Bucky diaphragm is essential for clarity, at least for films taken in the antero-posterior position. The use of sedative drugs and anæsthetic agents to secure immobilization is contraindicated. Generally it may be said that the clinician does not appreciate the extreme difficulty of obtaining even reasonably good X-ray pictures in the case of very restless patients. When patients are violent, success is often impossible. In any case, primary examinations with a portable machine should be repeated with an adequate machine when and if permissible.

Three standard radiographs of the skull, two lateral views and one in the antero-posterior position, constitute the usual X-ray examination in acute injuries, and even though the taking of the skiagrams entails little disturbance of the patient, the examination should never be carried out on a patient suffering from shock; treatment of shock is far more urgent than the demonstration of a fracture. A confused and restless patient should not be turned upon his face for the taking of a postero-anterior film, or he will usually resist violently.

These three films are adequate for a primary examination, and rarely should anything more be attempted with a bedside unit, except possibly the taking of a tangential film to demonstrate depression. Even this elaboration and all other special projections are best made later, on full size equipment. Such examinations may include the taking of views of the sinuses, the mastoids, the basi-occipital and the foramina, especially the optic foramen, as indicated, or as the condition of the patient permits. Foreign bodies may then be localized if they have been detected in the initial films.

Acute surgical head emergencies permit little in the way of radiography other than the demonstration of possible fracture. In injuries without urgent surgical indications the main lines of treatment are already apparent, and detailed radiography can await the patient's clinical improvement. Needless to say, hemorrhage, contusion, laceration, abscess and oedema are never directly visible on the plain X-ray film in any degree whatsoever.

In some clinics, the taking of stereoscopic films is advocated as a routine measure; but my own feeling is that they should be reserved for special difficulties, when injury or abnormality has been already detected by previous films. By far the great majority of routine films taken for head injury reveal no lesion, and economy of films must be taken into consideration. The stereoscopic film practically never detects a fracture which is missed by the plain X-ray film; but it is useful to settle questions concerning the position and relation of fragments of foreign bodies or of obscure areas of calcification. Sometimes stereoscopy is necessary to decide on which side of the skull the fracture lies.

Interpretation of the Films.

Most gross fractures of the skull are immediately obvious on the films, even to the inexperienced. Fractures may take the form of fissures, comminuted or depressed areas of bone or separation along a suture line. Rarely, whole pieces of the cranium may be sliced away.

The probability that the dura has been perforated should be estimated from the size, shape and position of the fragments. The detection of minor fissured fractures, however, implies a close acquaintance with the complex

markings on the skull which are caused by sutures, meningeal vessels, diploic sinuses, arachnoidal granulations and hyperostoses. All of these may cause confusion. The pattern changes with age. In infancy, the cranium is a relatively featureless sheet of thin bone. In young adult life, up to about thirty-five years, the meningeal vessels produce the most prominent impressions. With increasing age the diploë thickens and the diploic venous sinuses increase. Still later as age advances these sinuses again decrease as the diploë consolidates and the sutures become obliterated.

Sequelæ of Head Injury.

In the detection of the later sequelæ of head injury plain radiography plays but a small part. The plain X-ray examination of the head in such cases mostly brings forth a negative report. Nevertheless, it should be carried out thoroughly as the opening gambit in the investigation of post-traumatic complaints. Ordinary fracture lines in adults remain visible for one to two years, but they often vanish in six to eight months in children. A gross hiatus in the skull never closes with bone at all, and indeed in children the gap grows larger with the growth of the child. Rarely, a fracture line, as the months go on, may extend and widen, owing to a process of rarefying osteitis, akin to the pathological entity which causes Kümmel's disease in the vertebra—a kind of localized post-traumatic osteomalacia.

Osteomyelitis shows up as a patchy, moth-eaten area, which may slowly extend for months, involving only the outer table. Incidentally, before any plastic operation is performed on the cranium the edges of the hiatus should appear clear and firm. If they are irregular and patchy, probably a latent infection is present which may light up after operation.

Rarely, a chronic subdural hæmorrhage or abscess may calcify and become visible; but usually any post-traumatic changes in the brain are not visible in the plain X-ray films. A rare variety of gas-forming brain abscess may show a fluid level.

Lastly, the plain X-ray film may reveal collateral information suggesting that the patient's symptoms are not due to the injury sustained at all—for example, a meningioma, a mastoid infection or *osteitis deformans*.

Comment.

We may therefore say concisely that the plain radiographic examination of the skull demonstrates injury to and changes in the bony cranium, but not post-traumatic or other changes in the cranial contents. It is an objective method of most significance in recent head injuries and necessitates no special knowledge of neurology.

Pneumocephalography.

When air is injected into the cranium, the circumstances are very different. Ventriculography outlines the ventricles, and encephalography in addition renders visible the cisterns, the cortical pathways and almost any part of the subarachnoid space. The anatomy of the skull contents is revealed, in its gross features at least, as the cerebro-spinal fluid drains away and is replaced by visible air. The normal appearances so produced on the film are now fairly well understood; but the interpretation of pathological changes requires a fairly considerable neurological knowledge, in much the same degree as barium meal work requires knowledge of the main principles of gastro-enterology.

The method has obviously no indication in recent head injuries; but in the demonstration of post-traumatic change it is of considerable significance.

The central key to the pneumocephalogram is a consideration of the ventricular appearances. Deviation from the mid-line may be due to a space-filling lesion pushing to the opposite side, or alternatively, to scar tissue or atrophy pulling to the affected side. Local deformities of the ventricles may localize the lesion more accurately. Dilatations suggest obstruction, and the pattern and extent of the obstruction have again a localizing value.

Asymmetrical dilatation may be caused by atrophy of the brain as well as by unilateral obstruction to the cerebro-spinal pathway.

Traction diverticula may be seen and porencephalic cysts are accurately visualized. Such findings are of value in the diagnosis of chronic subdural hæmorrhage and abscess as well as of tumour. Meningo-cerebral scars and localized areas of cortical atrophy may be seen as changes in the usual pattern of the subarachnoid spaces.

Traumatic aneurysms are sometimes incidentally seen in profile against the injected air, but are more often discovered after visualization of the intracranial vessels by the injection of "Thorotrast" into the common carotid artery.

Obviously the interpretation of all these phenomena is not a simple objective statement, but involves a more or less detailed consideration of symptoms and neurological data, particularly if we include intracranial tumours in our survey. The procedures required for the introduction of the air are necessarily surgical and specialized. It is difficult to see how any radiologist without special facilities and opportunities can become expert in this work. It cannot be done casually in the ordinary routine of hospital work and is therefore more or less confined to special clinics.

I believe that a trained radiologist should be attached to each neurosurgical clinic, firstly that he may educate himself in these new fields so that, secondly, he may be able ultimately to return to the neuro-clinician a higher grade of radiological assistance than at present. As a technical assistant alone, even without special neurological training, he is worth his place. Give him this special experience, and the complex field of ventriculography and encephalography will be fully exploited by adequate cooperation of radiology and surgery with the best technique in both branches. The most perfect surgical introduction of the injected air may be achieved; but the examination will be robbed of its full results if imperfect or insufficient films are taken with unintelligent posturing of the patient.

Conclusion.

Modern high-speed life has increased the cranial risks of the community. It is probable that this and the stimulus of the war will make the discoveries of neurosurgery, especially in its traumatic aspects, one of the noteworthy advances of the century. Let me finally urge that the radiologist be permitted to train for his job in the neurosurgical team. I feel that he will later on fully justify his inclusion.

NEUROSURGICAL SEQUELÆ OF HEAD INJURIES.¹

By W. LISTER REID,
Sydney.

In discussing the neurosurgical sequelæ of head injuries, I should like to mention the various conditions that may result from such accidents, according to the anatomical structure affected. In most cases the diagnosis is obvious or can easily be ascertained by careful examination, X-ray investigation or lumbar puncture. These cases I shall merely mention in passing, except that I should like to emphasize in one or two of them certain points which I feel are important with regard to treatment. There are certain other sequelæ that I should like to discuss in greater detail, as the problem of diagnosis and localization usually constitutes our greatest worry.

Scalp Injuries.

An injury to the scalp may result in œdema, bruising, abrasions or lacerations, all of which are obvious and are treated on general lines. In treating lacerations, be sure

¹ Part of a symposium on head injuries, read at a meeting of the New South Wales Branch of the British Medical Association on June 24, 1943.

to excise the edges, to remove all debris and damaged tissue, to sterilize the wound, and to suture it with superficial interrupted stitches only. A hematoma of the scalp requires no surgical treatment, unless it is very large. In only one case have I found it necessary to aspirate such a hematoma; in this case, the whole scalp from the forehead to the occiput was raised up by the underlying blood, which amounted to several ounces. Be careful not to mistake a hematoma for a depressed fracture. In a hematoma the centre is soft, and the edge is firm and sharply demarcated, while in a depressed fracture, on those few occasions on which it can be felt at all, the edge is usually much less sharply defined. It is wise to confirm any doubts by X-ray examination before contemplating surgical treatment. Infection of the scalp is important, in so far as it may lead to more serious complications if it is not properly treated. Adequate drainage and removal of dead tissue are the most important points.

Injuries to the Bone.

The commonest injury to the bone is a simple linear fracture, and this in itself requires no treatment. With regard to simple depressed fracture, I believe that it should always be treated by open operation and elevation of the depressed fracture, whether it is causing immediate symptoms or not; especially is this the case if the depression is near the sensory or motor area. From the outside, there is no way of telling whether the dura has been torn or not. If the dura is not injured, it is unlikely that damage to the underlying brain has occurred. If, as is usually the case, the underlying dura is torn and the brain is damaged, a meningo-cerebral cicatrix results, consisting of a localized dense mass of astrocytes and their fibres mixed with fibrous tissue growing in from the dura and blood vessels. In such cases the patient is very prone to develop post-traumatic epilepsy at some future date. Compound linear fractures are treated as for lacerations of the scalp. Compound depressed fractures are treated in the same way, with the exception that it is wise to remove completely all fragments of bone, to avoid the risk of osteomyelitis. In cases in which osteomyelitis does develop, there is only one possible method of treatment, and that is to remove all infected bone, no matter how large the area, until normal bleeding bone is encountered. More conservative removal of bone will seldom cure the condition, and it merely tends to prolong the patient's stay in hospital. The only other point of importance with regard to bone injury is the question of the advisability of repairing bone defects. I do not think this is necessary in the vast majority of cases, and the patient can always wear a protective covering over his head when this is required. Occasionally repair is necessary. A case in point is that of a returned soldier upon whom I carried out a plastic bone repair to a skull defect resulting from a bomb splinter. He had a left hemiparesis and when he was walking in the upright position his arm was completely paralysed. After a night's rest in the horizontal position, a good deal of movement and normal sensation returned to the arm. The reason for this was that when he was in the upright posture the brain sagged considerably downwards from its normal position, and this probably interfered with its blood supply or drainage. After the plastic repair there was considerable improvement in the movements of his hand and arm, and the sensation remained normal.

The Cerebro-Spinal Fluid.

The cerebro-spinal fluid is very important in cases of head injury, and its pressure is prone to vary considerably in different people. There is usually, but not invariably, an elevation of the cerebro-spinal fluid pressure following an injury to the skull. In most cases this elevation is slight and settles down without any interference; in some cases the pressure remains elevated and has to be reduced to normal by lumbar drainage. Such elevation of pressure may persist even for months after the initial injury, and it is frequently a cause of post-traumatic headache. Sometimes one finds an abnormally low cerebro-spinal fluid pres-

sure following a head injury; these patients are treated by elevation of the foot of the bed, and by forcing of the fluid intake. The headache associated with low cerebro-spinal fluid pressure is similar to that caused by high pressure; the only difference in the underlying mechanism is that the former is caused by traction, and the latter by pressure on the sensitive intracranial blood vessels and venous sinuses. Subdural hygroma is rather a rare condition, and is similar in its symptomatology and treatment to subdural hematoma, which will be discussed later. Leaking of cerebro-spinal fluid from the nose and ear is occasionally met with and may prove troublesome. It usually clears up of its own accord within a few days; but if it persists, it may be necessary to perform a craniotomy to repair the dural defect and remove the piece of tissue which usually lies between the edges of the fractured bone. The danger in these cases, of course, is the spread of infective organisms, resulting in meningitis. In cerebro-spinal rhinorrhea the patient, if conscious, must be warned against blowing his nose or sneezing, as such actions may force infective material into the cranial cavity. If fluid is leaking from the ear, the patient should be lain on that side with a large dressing over his ear. Do not, in any circumstances, plug the ear or attempt to cleanse it for examination, as this may force infective material inward.

The Intracranial Blood Vessels.

The sequelae involving the intracranial blood vessels provide some of our most difficult problems in cases of head injury. In most cases of severe injury there is evidence of petechial hemorrhages scattered throughout that part of the brain which has been damaged. The treatment of this type of hemorrhage resolves itself into treatment of secondary conditions resulting from the hemorrhage, such as elevated cerebro-spinal fluid pressure and cerebral edema *et cetera*. Extradural hemorrhage requires little comment from the point of view of diagnosis and treatment. The history of an injury with a period of unconsciousness followed by a lucid interval of consciousness, and then a gradual loss of consciousness, is the characteristic story. The presence of epileptiform seizures and loss of power on one side of the body are helpful in the localization of the lesion. We must remember that not infrequently a hemiplegia may occur on the same side as the hemorrhage. This is produced by the expanding lesion pushing the midbrain towards the opposite side and compressing the opposite *crus cerebri* against the sharp free edge of the *tentorium cerebelli*. If focal Jacksonian epileptic seizures occur, there is no question of lateralization, for such attacks must invariably originate in the opposite hemisphere. I should like to impress upon you the importance of pupillary signs in this and in other types of intracranial expanding lesions. A fixed, dilated pupil is almost invariably indicative of an intracranial expanding lesion in the temporal, frontal or parietal lobes of that side. It is due to direct compression of the third nerve by the pressure of the overlying brain. On rare occasions the opposite pupil becomes dilated and fixed; I have seen this once, but can offer no explanation of the underlying mechanism. Subdural hematoma is frequently difficult to recognize and even more difficult to localise. It is more common in older people, and is usually the result of venous bleeding into the subdural space. The amount of blood is not great because of the low venous pressure, and it soon coagulates or becomes encysted. The fluid within this sac is highly concentrated, and it acts as a hygroscopic agent and absorbs additional fluid into its cavity, thus slowly increasing in size. Patients with a subdural hematoma usually make a good recovery up to a point, but they do not get quite well. They may be listless and irritable, may complain of vague generalized headache, and may perhaps exhibit some mild mental disturbances. Eventually, usually after a period of a few weeks, their condition deteriorates and they finally become drowsy and unconscious. The simplest procedure is to make a burr hole over the site of injury or fracture, if present. It may be necessary to put in more than one burr hole before

striking the fluid. The usual sites are fronto-parietal and occipito-parietal. When the hæmatoma is encountered, the fluid is sucked out and the cavity is well washed out with Ringer's solution. A rubber drain should be left in for twenty-four hours. Some people prefer to place two burr holes over the cavity and wash out the cavity through them. If a subdural hæmatoma is strongly suspected, but cannot be found, one must have recourse to encephalography and ventriculography. Occasionally a subdural hæmatoma may be situated beneath the temporal lobe.

Subarachnoid hæmorrhage is common following a head injury. It is recognized by the results of lumbar puncture, and requires no special treatment. One point is worthy of note: I have seen one case of aseptic or sterile meningitis following a head injury, and this was probably due to a reaction produced by some constituent of the blood cells or plasma on the meninges. A single large intracerebral hæmorrhage is not common, and is usually difficult to recognize. It may occur at the time of the accident, or it may occur several days later, into an area of softened brain tissue; to the latter we apply the term *spatopoplexy*. In order to localize such a hæmorrhage, one must depend upon the history of injury and upon the clinical signs exhibited, and if these are insufficient, one must resort to ventriculography. If the localization is exact, the blood can be easily aspirated through a brain needle inserted through a burr hole, and the cavity may be washed out with Ringer's solution. It is well to mention here the common condition of post-traumatic headache resulting from dural adhesions. Such a headache usually commences some months after the accident. It is generally confined to the area of the injury, and is frequently associated with dizziness. Two methods of treatment are used: (i) subarachnoid air insufflation, by replacement of the cerebro-spinal fluid with air by the lumbar route and the directing of the air to the subarachnoid space in the region of the initial injury; (ii) subdural air insufflation, by injection of the air directly into the subdural space through a burr hole. This bubble of air stretches the fine, tough adhesions that exist between the dura and the underlying sensitive blood vessel, or between the arachnoid and venous sinuses, so that when the air is absorbed and the brain has returned to its normal position, these adhesions are slack and no longer cause tension on the sensitive subdural structures. I no longer employ the subarachnoid route of air insufflation, as the number of patients relieved by this method was not satisfactory. I have had much better results with subdural air insufflation, and have found that by this method relief is obtained in practically every genuine case.

Damage to the Brain.

The brain is by far the most important structure that suffers as a result of head injuries; but it does not very often offer itself to surgical treatment. Lacerated brain tissue should be removed when one operates for a depressed fracture, but otherwise there is no indication for surgical interference. Central hyperthermia is frequently met with in varying degrees after a head injury; occasionally the temperature may rise to 104° F. or more. This rise is due to a disturbance of the central thermal control mechanism, and is usually recognizable by the fact that the extremities are cold, whereas the body is hot, while in infective hyperthermia the extremities are also hot. The treatment consists of reducing the surface body temperature by gradually reducing the amount of bed clothes as indicated, by sponging the patient with spirits or cold water, and in extreme cases by packing the patient in ice and giving frequent rectal douches of iced water. Cerebral aerocoele is a rare curiosity, and results from the gradual ingress of air into the brain tissue through a fracture involving one of the nasal sinuses. When I was a student, there was one patient under my care whose flat X-ray films revealed a huge cavity filled with air in his left frontal lobe, and the whole ventricular system was completely filled with air. The treatment of this condition consists of the performance of a craniotomy and the closure of the opening through which the air has entered. There is, of course, a grave danger of meningitis.

Post-traumatic aural vertigo is a fairly frequent and often a troublesome sequel of head injuries. It is probably due to some vascular disturbance in the vestibular apparatus, and in most cases the condition gradually subsides. In some, injections of histamine may be tried, while in others benefit is derived from a mild sedative. Cerebral abscess is occasionally encountered, and no matter what method of treatment is used, carries a high mortality rate. The brain has an excellent power of resistance by walling off the area of infection; but there is considerable difficulty in evacuating the pus without infecting the subarachnoid space. Lastly, post-traumatic epilepsy is an all too common sequel of brain injury. The seizures result from a cerebral or meningo-cerebral cicatrix. The process involved in the recognizing, localizing and removing of the epileptogenic focus is a rather complicated and extremely tedious procedure. Very briefly, it is done by obtaining an accurate description of the attack or preferably by observing it oneself, by pneumoencephalography, and by electroencephalography. Having localized the focus, one must map out with extreme care and accuracy each sensory and motor point in the cortex exposed, before one attempts to remove the lesion.

Conclusion.

I regret my inability to deal more fully with some of the conditions, but time does not permit. I have tried to deal with certain problems with which you are likely to come in contact, and to neglect those about which you know just as much as I do and those in which you probably have little more than a passing interest. I have omitted the condition of concussion from this paper as it will be discussed in detail by Dr. Phillips.

CEREBRAL CONCUSSION.*

By GILBERT PHILLIPS,

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In Paris, in 1705, a young criminal, in an attempt to avoid the rack, after measuring the confines of his cell, placed his arms behind him and charged the opposite wall, striking it with the vertex of his skull. He immediately dropped dead. Littré performed an autopsy on this man, the results of which he published; he stated that he was unable to find any evidence of damage to the scalp, the calvarium or the intracranial contents. From this time speculations arose as to the part played by physiological neuronal injury in the production of unconsciousness and the after-effects of head injury, and in 1866 Erichson coined the term "*commotio cerebri*" to indicate the presence of physiological disturbance of neural activity of the brain in the absence of oedema, hæmorrhage or laceration. From that time much experimental and clinical work has proved that a blow on the head can cause unconsciousness terminating in death, without any macroscopic or microscopic lesion in the central nervous system. Recently Denny Brown demonstrated in laboratory animals that not only was this so, but that repeated subliminal violence could be summated to cause concussion and unconsciousness, from which, not infrequently, a fatal result might follow without any demonstrable organic injury to the brain.

Since this is so, it becomes necessary for contemporary neurologists to clarify their ideas regarding cerebral concussion, about which, particularly in medico-legal circumstances, much confusion has developed. There is little doubt that in general use obscurity still surrounds the term concussion, and that laxity in its application has done much to cloud the rational approach to the treatment of the post-traumatic state.

Rowbotham, in his recent book, has referred to the three current doctrines of cerebral concussion, namely:

* Part of a symposium on head injuries, read at a meeting of the New South Wales Branch of the British Medical Association on June 24, 1943.

(i) transient vascular disturbance, (ii) physiological neuronal damage, (iii) organic cerebral injury.

Trotter postulated the theory of transient vascular disturbance as the basis of cerebral concussion. Under this conception, violence produced unconsciousness by alteration of neuronal vascular supply. Two important implications are inherent in this theory, namely: (i) if unconsciousness persists it is not due to concussion alone, but some additional trauma is present, and (ii) complete recovery must always occur from concussion *per se*, and the sequelæ of head injuries are due either to disturbance in the psychological field or to actual brain damage. It is on these two points that Trotter's hypothesis must fall if transient vascular change alone is to be regarded as responsible for concussion, since it is known that a man may die following a blow on the head which renders him unconscious until death, in the absence of any microscopic injury to his central nervous system.

The second hypothesis, namely, that of physiological damage, implies an alteration of neural activity producing unconsciousness as the result of mechanical factors. That such a condition can occur is well known as the result of experiment. Within certain limits, local pressure or tension on nerve cells and nerve fibres will prevent the transmission of impulses which are again conducted normally when the normal mechanical state is restored. This doctrine of physiological change suggests that unconsciousness results from altered cerebral activity, and that the latter does occur in transient unconsciousness following head injury has been shown in a great number of cases by electroencephalography.

The third hypothesis, that concussion results from such organic damage to the brain as contusion, petechial hemorrhage or cerebral edema, must be regarded seriously, since the mechanical conditions existing in a soft vascular organ completely enclosed in a rigid bony case unquestionably predispose it to frank organic trauma. It is universal experience that even in mild cases of head injury lumbar puncture may disclose blood-stained cerebro-spinal fluid under increased pressure, and therefore it would be foolish to deny that organic intracranial damage does often play a prominent part in the post-traumatic state. On the other hand, it is equally well known that even in more severe cranial injuries the patient may be unconscious and may exhibit no abnormal neurological signs; moreover, there may be no change either in the cerebro-spinal fluid or in its pressure. So it would seem equally foolish to state that in all cases concussion is due to actual cerebral injury.

The work of Dennis Williams on electroencephalography in acute head injury and chronic post-traumatic states has thrown some further light on this problem. He has shown that in acute head injuries "widespread abnormal slow waves of cerebral electrical change, suppression of the normal frequencies and clear cut outbursts of high voltage sine waves" occur in the acute stage of cerebral concussion. He further stated that "the degree of abnormality seen in the electroencephalogram correlated closely with the clinical state of the patient, cases of mild head injury without residual symptoms showing a normal electroencephalogram within a few hours of the accident and severe injury causing the abnormalities to persist for many weeks". The fact that these abnormalities in cerebral discharge are widespread immediately following an accident and may clear up completely within a few hours is the strongest evidence that a purely physiological disturbance may be the sole basis of concussion and unconsciousness. The question, however, may rightly be asked: "Is there any justification for the rigid separation of the three hypotheses advanced to explain unconsciousness following a blow on the head, when it is not only probable but almost certain that some degree of overlap between them must occur from case to case?" Surely it is the pattern of such overlap that determines the fact that no one case of head injury ever precisely resembles another, in the depth or duration of stupor, in the course of recovery or in the later psychological status.

My own experience makes me say that if the term "concussion" is to be a rational one of general value, it must be applied only to physiological disturbance of

cerebral activity caused by external violence. It must be regarded as a probable and very frequent cause of unconsciousness, but by no means as the universal cause. It must be regarded as being capable of causing death *per se* or any of the later sequelæ ranging from mild psychological disturbance to post-traumatic epilepsy. If this view is to be adopted, a diagnosis of cerebral concussion should be made in the case of an unconscious patient only when there are no abnormal neurological signs and when clear cerebro-spinal fluid is found under normal pressure. If focal signs appear, or if the intracranial pressure is raised, or if there is blood in the cerebro-spinal fluid, it is certain that organic damage has occurred, in cerebral vessels, in the choroid plexuses or in the neural or glial components themselves.

Conclusion.

In conclusion, a great deal could be said about sub-clinical concussion and the relation between purely neurophysiological disturbances and subsequent post-traumatic epilepsy. It would seem that too much emphasis has been placed on the grosser elements of cerebral injury, such as cerebral scars and anastomoses between the circulation of the scalp and the cortex, in the aetiology of post-traumatic epilepsy, and that too little thought has been given to the traumatic alteration of the activity of the cortical cells. It is significant that, in my experience, in many hundreds of cases of post-traumatic epilepsy investigated by air studies a normal ventricular and sub-arachnoid system is found without any discoverable change in the surface or ventricular contours of the brain. Others have observed and recorded this fact. There is much truth in Dennis Williams's conclusion that "the electroencephalogram accurately reflects the abnormal cerebral state caused by a recent head injury, that the progressive changes are a direct indication of improvement or deterioration in this state, and that in the milder states of cerebral dysfunction it may demonstrate residual damage after all abnormal clinical signs have subsided".

Reports of Cases.

THE RAPID ONSET OF PUTREFACTION IN DEAD BODIES.

By J. B. CLELAND, M.D.,
Marks Professor of Pathology, University of
Adelaide.

FROM a medico-legal point of view, it is often necessary in connexion with a dead body to estimate as nearly as possible the period that has elapsed between death and the examination. The degree of warmth of the body, the presence or absence of *rigor mortis* and the amount of decomposition may all help in coming to a provisional opinion. The following examples indicate how rapidly, in certain circumstances, the body may become almost unrecognizable from bacterial changes occurring or progressing after death. I was considerably surprised to find, in a *Clostridium welchii* infection accompanying a macerated fetus, that the body had become grossly swollen and discoloured in 15-75 hours after death.

Apart from physical conditions favouring early putrefaction, such as warm, muggy weather, the presence before death of considerable numbers of *Clostridium welchii* and allied organisms and of a thick layer of subcutaneous fat reducing the rate of cooling of the body both probably play an important role in rapid decomposition. In sheep, the presence of many *Clostridia* in the intestinal contents leads so rapidly to loss of nuclear staining in the mucosa that it is necessary to fix portions of the intestine required for histological examination immediately after death. In human beings, the numbers of *Clostridium welchii* and its allies in the intestinal contents vary; but they are sometimes probably very numerous, especially in cases of partial or complete obstruction. In cases in which *Clostridium welchii* organisms are introduced into the uterine cavity in the procuring of an abortion, their multiplication in the separated part of the placenta and in a dead retained fetus leads to easy invasion of the uterine wall during life and

to massive multiplication in the tissues of the body as soon as death occurs.

Case I.

On March 20, 1939, the body of a young man was taken from the Port Adelaide river. Evidence submitted leaves no doubt that this was the body of R.G.S., who had been last seen alive on the evening of Friday, March 17. At about 10.15 a.m. on the Monday the body had been noticed floating almost straight up with the head tilted back, all being under water except the head and neck. Dr. J. E. Porter examined the body about 1 p.m. and found it in a state of advanced decomposition. The face was black and swollen; the features had been destroyed by sea lice about the eyes and mouth; water was issuing from the mouth and nostrils; the face was unrecognizable; excreta had been passed in the clothing; the body was not greatly distended; the odour was extreme; the tongue was forced between the teeth; the hair was loose and easily removed, coming out in handfuls when caught hold of. Dr. Porter estimated that the body had been dead for at least seven to ten days. Next day a post-mortem examination was made. The body now was greatly distended with the gases of decomposition; the skin was peeling off the abdomen and numerous blebs had formed; the skin of the body was greenish-brown in colour; the veins over the chest were blackish and standing out; decomposition had set in, in the brain itself, which was fluid in consistency; the pleural cavities were both half-filled with water, and water was present in the stomach. Death had been due to drowning. Dr. Porter again expressed his opinion that the body had been in the water for a minimum of seven days, basing this view on his personal experience of other bodies drowned in the Port Adelaide district, but more particularly on the literature available to him on the subject. He considered that the state of decomposition was in complete exception to accepted medical theories on the subject if the body was really that of R.G.S., who had been seen alive two and a half days before the body was removed from the water. The weather at the time was mild, the maximum shade temperatures being as follows: March 16, 79-6° F.; March 17, 82-3° F.; March 18, 80-2° F.; March 19, 79-9° F.; and March 20, 81-6° F. The coroner, in summing up, felt some doubt as to whether this was the body of R.G.S., in view of the opinion expressed by Dr. Porter. There seems, however, no doubt that it was the body of this person, no trace of whom has since been seen. Moreover, no other is known to be missing. Various marks of identification were also established.

Case II.

On February 12, 1940, I received a request to make a post-mortem examination of a man, aged fifty-four years, who had died at the Parkside Mental Hospital at 11.15 a.m. that day, after having had severe hæmatemeses and melena from a duodenal ulcer. I was asked to hold over the performance of the autopsy if possible until next morning, so that the medical officer particularly interested in the case might be present. The weather was very muggy after a heat wave. The maximum shade temperature at Adelaide on February 12 was 94-8° F. and on February 13, 101-8° F. At the autopsy on February 13, twenty-two hours after death, the body was noted to be rather emaciated; the skin was peeling from the upper part of the arms and round the shoulders. There was some green discoloration of the abdomen, which was distended. There was a strong smell of decomposition, of that penetrating nature which accompanies one for the rest of the day, and the brain was putrescent and showed the greenish-grey tinge associated with decomposition; it was too diffident for the recognition of any pathological agents, if they were present. In this case there had probably been a distribution of saprophytes from the alimentary canal at the time of death and shortly afterwards, seeding such organs as the brain; the incubator temperature of the atmosphere would facilitate the multiplication of these organisms and the onset of putrefaction.

Comment.

In view of the necessity for accurate data as to the rapidity of putrefaction in human bodies during summer weather in Australia, this case and the preceding one seem worth recording.

Case III.

This case, that of a woman, aged thirty-nine years, has already been reported from the clinical side by Dr. W. F. Joynnt ("An Unusual Case of Bacillus Welchii Infection", *THE MEDICAL JOURNAL OF AUSTRALIA*, October 3, 1942, page 322). The patient died at 7.45 p.m. on July 2, 1942—that is, in the middle of winter. At the post-mortem examination at 11 a.m. on July 3 the body felt still somewhat warm.

The face was found to be greatly swollen. Examination of the eyelids and lips revealed a dirty green discoloration, and the eyes were closed by the swelling. There were large blebs over the trunk and thighs, and sheets of epithelium were peeling off. There was discoloration round the swollen vulva. A gas burning with a blue flame escaped when the abdominal cavity was opened. Gas escaped when the breasts were incised, and crackling could be felt in the thoracic tissues and in the heart muscle. The liver was foamy. The kidneys were very dark brown. The uterus was disintegrating. The body had a peculiar, rather unpleasant sweet smell.

An interesting point in this case is that during delivery, the sister in charge thought she saw bubbling in the vagina.

Case IV.

Early on the morning of September 30, 1942, the discoloured and swollen body of a young woman, aged twenty-five years, was found propped against a post by a country roadside near Adelaide. At 10 a.m. an examination showed that the face was bloated and discoloured purple, the eyelids were so swollen that the eyeballs could not be seen, the tongue was just projecting from between the teeth, blood-stained mucus was escaping from the nose, the breasts were greatly puffed up, and the abdomen was tense. Purple discoloration of the thighs was present. When the fat over the sternum was incised, a gas escaped from the tissues that burnt with a blue flame and which I blew out; the tissues crackled under the fingers. Gas escaped when the abdominal cavity was opened. The uterus reached as high as the umbilicus and was discoloured and flabby; it contained a foetus of about six months' development in its membranes. The placenta had been partly separated from the wall, and some rather clear liquid occupied the space between the separated part and the uterine wall. This liquid was sent to the Government Analyst with the suggestion that soap should be looked for, and this was found. The liver was very foamy and the heart muscle was pale and crackled under the fingers. The body had a sickly sweet smell. The rectal temperature was between 79° and 80° F., the thermometer dropping to the room temperature of 61° F. on removal. From these appearances and from the fact that the body was still slightly warm, the inference was made that death might have occurred about sixteen to twenty-four hours previously.

Reviews.

A YEAR BOOK ON NEUROLOGY, PSYCHIATRY AND ENDOCRINOLOGY.

In the issue of June 12, 1943, several of the 1942 series of year books of the "Practical Medicine Series" were reviewed and their general characteristics were described. The 1942 volume dealing with neurology, psychiatry and endocrinology has been published.¹ The section on neurology is edited by Dr. Hans H. Reese; it occupies 306 of the 752 pages covering the three sections. After an introduction there are eight subsections. Following the first on anatomical, physiological and pathological contributions, another is devoted to headache, migraine, epilepsy and electro-encephalography. Then in turn are considered disorders of the central nervous system, disorders of the cerebro-spinal vascular system, disorders of the muscular system and vitamins, cranial and peripheral nerves, the autonomic nervous system and syphilis and the cerebro-spinal fluid. The editor has been generous in his treatment of many of the articles; he has included useful illustrations, which on the whole have been reproduced fairly well. The section on psychiatry, edited by Dr. Nolan D. C. Lewis, treats in turn of general topics, child psychiatry, schizophrenic psychosis, affective disorders, organic reactions, toxic psychoses, psychoneuroses and psychosomatic disorders and military psychiatry. In the last-mentioned subsection the selection of recruits is discussed; the article by Cooper and Sinclair in this journal on war neuroses in Tobruk is mentioned. The section on endocrinology is edited by Dr. Elmer L. Sevringhaus. It is divided into two main subsections dealing respectively with the pituitary group and a miscellaneous group of glands.

¹ "The 1942 Year Book of Neurology, Psychiatry and Endocrinology"; "Neurology" edited by Hans H. Reese, M.D., "Psychiatry" edited by Nolan D. C. Lewis, M.D., "Endocrinology" edited by Elmer L. Sevringhaus, M.D.; 1943. Chicago: The Year Book Publishers, Incorporated. 7 3/4" x 5", pp. 768, with 134 illustrations. Price: \$3.00, post paid.

The Medical Journal of Australia

SATURDAY, AUGUST 21, 1943.

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EDUCATION, PROPAGANDA AND THE PRESS.

THE process of education is one that has to do with the development of man in his physical, intellectual and moral aspects. It bespeaks the reaction of man to his environment, but in a purposive way; it is a positive process, as the derivation of the word suggests. Education has been said to include all those processes consciously adopted by a given society for realizing in individuals the ideals which are approved by the race or the particular group. This implies that conformity to certain standards and usages is an essential attribute of an educated man. In regard to ideals of morality in its broadest sense, this will be accepted; but if ideals are to include those of a social or economic kind, assent will have to be withheld. During his education man gradually gains an understanding of the meaning of life; he achieves his insight by a study of history and science, of philosophy and religion. His character is developed to such a degree that he is in a position to choose a course of action. If a course of action is likely to have a worthy or creditable result the educated man will know that he is making a good or a wise choice; he will also know in other circumstances whether what he thinks of doing is bad or foolish. Clearly education is a continuous process. It lasts while life itself lasts. A man may justly be styled an educated person; but an educated person knows that his education is never complete. Even in advanced years he will continue the process begun by others in his youth and will learn from each new experience something to add to his storehouse of criteria. And it is the unexpected, the surprise, in life that gives it zest. The statement is commonly made of a man or woman that he or she was educated at such-and-such a school. If the school was a really first-rate school, it might be correct to say that his or her education was continued at that school, the presumption being that education was begun where it ought to have its origin, in the home. Education is often confused with instruction. Instruction has to do with the imparting of facts. It has been said to include all the different means and methods adopted under the direction of a particular institution, usually the school,

for accomplishing certain particular ends, wholly or for the most part of an intellectual character. The cramming of a pupil for an examination is an example of instruction rather than part of education. To give instruction does not necessarily teach a pupil to think. The result will depend on the fertility of the pupil's mind, and this will be conditioned partly by natural endowment or aptitude and partly by any attempt at education already undertaken by parents or other mentors. Incidentally it may be remembered that the difference between instruction and education is recognized in official circles in some of the Australian States. Government departments originally and according to law styled departments of instruction are sometimes called departments of education, and the responsible ministers prefer to be known as ministers of education rather than adopt the official title of minister of public instruction. This is a *penchant* that should be encouraged, provided the alteration is not of name only.

Seeing that education will enable a man to choose his actions, we recognize a difference as soon as we think of propaganda, which seeks to make him adopt views chosen by someone else. Most people know that the object of propaganda is to influence opinion and conduct. But there is more to be said about it than this. Henry Wickham Steed, writing in the fourteenth edition of the "Encyclopædia Britannica", states that a distinction should be made between the purpose itself and the methods employed to attain it, and also between the original meaning of propaganda and the meaning which the word has gradually acquired. He explains that since the war of 1914-1918, when all the belligerent countries undertook it as an adjunct to their diplomatic and military operations, propaganda has come to be looked upon as mere advocacy of special interests or as an attempt to gain credence for statements partially or wholly untrue. Though this meaning was and still is justified, it is not exhaustive. In one form or other, Steed reminds us, propaganda is probably as old as mankind. Rulers, political leaders, founders of religions, of schools of philosophy and of new social systems have usually sought to persuade others of the goodness of their ideas and deeds. But force has been used as well as persuasion, and the history of the last few years can supply many examples of this. One of the most widespread types of propaganda is advertising, by which a cleverly turned phrase or a statement repeated over and over again prevails on an individual to buy a certain article; and we all know from experience that advertisements may be truthful or lying. The author of propaganda built up on untruths or on half-truths relies for its success on constant, and maybe loud-voiced, repetition. It is no doubt often a fact that the more exaggerated, the more impossible and untrue a statement is, the more likely is it that partial, if not complete, acceptance will be gained. The cleverest kind of propaganda is that which proclaims the truth, perhaps the unpleasant truth, and wins adherents. The success of such propaganda is a measure of the skill of the author and of his knowledge of mass psychology. In the same way, though the statement will not always hold, lying propaganda is often the product of the unintelligent. A lie, it has been said, has no legs and therefore has to be bolstered up with another lie, and this with yet another until the aggregation can be no longer supported and a crash takes place.

The present are days when men talk of freedom of thought and action, when indeed the allied nations are fighting to maintain and extend their freedom. They are days when education must more than ever be liberal and free from restriction. They are also days when the nation expects that propaganda served out to it shall be founded on fact and not coloured by the ulterior motives of persons or organizations. The most powerful public educator of today and the readiest instrument of propaganda, with the possible exception of radio broadcasting, is the Press. There is no doubt that many people form their opinions from what they read in newspapers. Nowadays we hear criticism of the Press; sometimes the criticism is ill-informed, sometimes it is justified. The Press of today may be considered from the two points of view of education and propaganda. It must also be viewed in relation to the days in which we are living. These considerations have recently been discussed in the light of two publications,¹ one on "The Daily Press" by Wilson Harris and the other on "The Newspaper" by Ivor Thomas. One of these authors states that some papers have reporters who are sent out, not to seek the truth, but to gather any such facts as will suit a particular propaganda campaign. This may be true of some publications, but in fairness it must be remembered that the outsider can seldom judge of the intention of a newspaper editor. A reporter may gather false information, but in these circumstances a desire for truth will be shown by a readiness to correct a false statement published unwittingly. While it is true that the law of libel may act as a deterrent to the exposure of abuses in the Press, it may be extremely useful in persuading a recalcitrant editor to correct a misstatement. The author mentioned, Wilson Harris, apparently thinks that the wilful gathering of false statements by reporters follows from low standards of fairness and of intellectual honesty inside editorial offices and is not caused by corruption from without. He states that it is to papers whose owners regard them as a public trust that we must look "to breed journalists jealous of the integrity and honour of the profession". Most of the fault-finding in regard to newspapers centres round the idea that the people should be served in the Press with what they want. Opinions differ widely in regard to what people want or think they want. The people who believe that public taste has risen during recent years are those who would foster newspapers as a good educational influence. But even they have to be content with a certain amount of marking time at present. Much of the frankly educational and literary sections of newspapers has had to be curtailed because of a shortage of newsprint. Associated with this is the enforced relationship that has arisen between newspapers and such persons as censors and officers of the Department of Information. Both writers whose work has been mentioned refer to officers of this type as having their uses, but add that a free Press must be wary of them. It is not only the Press that must be wary but also the public. Ivor Thomas declares that "it is only a small step from advice to instruction, but that step is all the way from a free to a totalitarian Press". At present the Australian people have to rely on the just discrimination of those who impose restrictions, that they will have sense enough not to attempt undue repression of essential facts or false emphasis on unessential facts. In

the same way the people must trust the Press to do the best that it can in the circumstances. We have in this country newspapers whose proprietors have ideals of service. The average Australian, if he stops to think, has enough discernment to recognize these journals, and in the post-war period when journalism is freed of its difficulties and restrictions he will look for and expect a full display of its latent energies. We do not think he will be disappointed.

Current Comment.

THE TREATMENT OF TUBERCULOUS PLEURAL EFFUSION AND EMPYEMA.

THE treatment of collections of pus in the pleural cavity occurring in the course of tuberculous disease is an ever-green subject for discussion. Thoracoplasty is the treatment most dreaded by patients who know what it entails; but there is no doubt of the successful results of thoracoplasty in achieving permanent obliteration of the source of much intoxication and danger to the sufferer. On the other hand, as was stated in an article in these columns on April 4, 1942, there is much to be said for the patient who is restored to an outward appearance of health by energetic aspiration and irrigation and who then refuses to undergo thoracoplasty, being often able and content to carry on with occasional palliative treatment for years. F. G. Chandler, of Saint Bartholomew's Hospital, has gone further, and in his last published communication before his untimely death last year has emphasized that fluid in the pleural cavity, tuberculous empyema and sterile collections of pus, even when large, may be benign and may be left entirely alone, the patient remaining in perfect health.¹

Chandler's view that fluid forming in the pleural cavity during the course of artificial pneumothorax should be aspirated only when it is large in amount, is one which is pretty generally held in this country. Thickening of the visceral pleura which may later present the problem of the inexpandible lung, is apt to follow any considerable collection of fluid that is allowed to persist, but Chandler remarks that he has seen the lung reexpand well after recurrent effusion and yet fail to do so though no fluid ever complicated the pneumothorax. When pyrexia and intoxication are present much depends on the character of the fluid. Chandler states that if after waiting there is no improvement, then we must have recourse to "the unsatisfactory methods that we have at our disposal", meaning, no doubt, aspiration and thoracoplasty. How long the waiting period should be is a matter for clinical judgement, but as J. R. Head, of Chicago, has pointed out, even when the fluid is purulent and secondarily infected, daily aspiration and irrigation will usually cause the fever to abate and the secondary infection to clear up in a week or ten days. Improvement in the patient's general health can then be expected, although palliative intervention may be needed from time to time for recurrence of pyrexia. If a bronchial fistula is present, long and patient treatment by aspiration and irrigation will be necessary.

Chandler reports the cases of twelve patients who had tuberculous pleural effusion or empyema complicating pneumothorax treatment, who were in good health and who remained healthy for periods up to 27 years, although they were permitted to go on carrying their fluid or pus about with them. He admits the incompleteness of such a record, unaccompanied by control cases or experiments and unsusceptible of statistical analysis; but they nevertheless seem to show that the pleura may occasionally become non-absorbing and that sterile fluid, whether serous or purulent with or without tubercle bacilli, may become inert and harmless and persist without causing perceptible ill effects for a very long time.

¹ The Times Literary Supplement, May 8, 1943.

¹ The British Journal of Tuberculosis, July, 1942.

Chandler's communication has recently been criticized by R. C. Brock,¹ of Guy's Hospital, who sees danger in "advocacy of conservatism coming from such an authoritative source". He points out that the greater number of patients with tuberculous empyema have active uncontrolled disease in the underlying lung, which cannot be left to take care of itself and which not only will make thoracoplasty obligatory, but will make delay in intervention hazardous. C. Hoyle,² of King's College Hospital, also criticizes Chandler's communication on the ground that only a small proportion of persons with tuberculous empyema could be expected to overcome the infection by natural means and that it is difficult to recognize this group in the early phases of the disease. He allows, however, that general measures, proper rest and repeated lavage and aspirations will sometimes succeed in converting a progressive empyema into a non-progressive one; and, if this happens and the improvement is steadily maintained and at the same time the control of the underlying lung is satisfactory, he sees no valid reason why that treatment should not be regarded as correct. But if within a reasonable time, measured in months, it becomes clear that the pleural disease is not amenable to such treatment, then for most cases, in his opinion, it will be arrested only when the pleural space no longer exists. The obliteration of the pleural space may be effected by reexpansion of the lung if this is permissible and possible; if not, thoracoplasty is essential and the benefit from it often immediate.

The oppositeness of the views which we have quoted on the treatment of turbid and purulent tuberculous pleural effusions must surely stimulate rather than confuse the student of this disease. In tuberculosis clinical acumen and judgement will always outweigh the book of rules and the healing power of nature will always vie with medical art to win the cure.

PENICILLIN.

As long ago as 1929 Alexander Fleming published observations on the antibacterial action of cultures of a penicillium.³ While he was working on staphylococcal variants he noticed that in one of a number of culture plates that were put on one side, around a large colony of a contaminating mould the staphylococcus colonies became transparent and were obviously undergoing lysis. The phenomenon was investigated. It was found that broth in which the mould had been grown at room temperature for one or two weeks, had acquired inhibitory, bactericidal and bacteriolytic properties to many of the more common pathogenic bacteria. The mould was found to be a penicillium. The best medium for the production of the antibacterial substance was ordinary nutrient broth. The active agent was found to be readily filterable and Fleming gave the name penicillin to filtrates of broth cultures of the mould. He described the properties of penicillin and suggested that it might be an efficient antiseptic for application to or injection into areas infected with penicillin-sensitive microbes. Many readers are no doubt familiar with the subsequent development of this work and know something of the extraordinary results obtained by workers at Oxford. It is important that in general appreciation of the Oxford work the observations made by Fleming should not be forgotten. The first communication from Oxford came from E. Chain, H. W. Florey, A. D. Gardner, N. G. Heatley, M. A. Jennings, J. Orr-Ewing and A. G. Sanders,⁴ who prepared penicillin as a water-soluble powder which was reasonably stable both as a solid and in solution. They found that it was active *in vivo* against at least three of the organisms inhibited *in vitro*, and expressed the "reasonable hope" that all organisms inhibited in high dilution *in vitro* would be found to be dealt with *in vivo*. In 1941 the Oxford group of workers presented their work in greater detail and

described "its further development to the stage of human therapy".¹ Those listed in the communication were E. P. Abraham, E. Chain, C. M. Fletcher, H. W. Florey, A. D. Gardner, N. G. Heatley and M. A. Jennings. They showed that large-scale production and purification were possible, though they also stated that it took one hundred litres of culture medium to produce one gramme of the dry substance. They reported that penicillin had been used by them in the treatment of patients suffering from different clinical conditions. In every instance the patient's temperature fell and general and local improvement occurred. They concluded that enough evidence had been assembled to show that penicillin was a new and effective type of therapeutic agent and possessed some properties unknown in any antibacterial substance previously described.

Another article has now been published from Oxford, this time by M. E. and H. W. Florey.² They set out some facts regarding penicillin before they describe their recent work. Their statement is as follows:

A reasonably stable impure sodium salt of penicillin can be made. This substance is extremely soluble in water, but is destroyed by boiling, by acids and alkalis, by certain heavy metals, by oxidizing agents and by enzymes produced by air and other bacteria. Penicillin is bacteriostatic and not bactericidal, at least in concentrations likely to be used therapeutically, and reliance must therefore be placed on the body defences, both humoral and cellular, to destroy the bacteria present in a lesion while penicillin prevents their multiplication. Pus, blood, serum and tissue autolysates do not interfere with the antibacterial action of penicillin and the number of organisms present has little or no effect on its capacities. Leucocytes will live and tissue cultures will grow in the presence of a concentration many times greater than that necessary to produce bacteriostasis. Mice will tolerate without toxic symptoms a dose much in excess of that which will produce bacteriostasis in their blood, and artificially induced infections in mice can be controlled by repeated injections of penicillin.

M. E. and H. W. Florey report that penicillin has been used in the treatment of fifteen patients suffering from serious illness, the drug being given orally, intravenously or by intramuscular injection. In ten cases a staphylococcal infection was present, in one a sulphonamide-resistant streptococcal meningitis, in three cases actinomycetes were involved and in one instance subacute bacterial endocarditis was due to *Streptococcus viridans*. The patients with staphylococcal infections included one with an orbital infection, four with acute or subacute osteomyelitis, three with pyæmia or septicæmia, one with fulminating cavernous sinus thrombosis and one with chronic osteomyelitis. All recovered, as did the patient with streptococcal meningitis. In two of the actinomycotic infections dosage was probably inadequate; in the third the streptothrix was eliminated. The patient with subacute endocarditis improved during treatment, but a relapse occurred when it was stopped. Penicillin was also highly successful in local treatment of mastoid and other infections. It was found that the most successful method of administration was by intramuscular injection at intervals of three hours. An attempt has to be made to regulate the dose so that the blood contains at least enough penicillin to inhibit the growth of the infecting organism. No toxic symptoms due to the drug have been noted.

M. E. and H. W. Florey and also *The Lancet* in an editorial point out that supplies for clinical use cannot be made available. *The Lancet* discusses the "Unequalled and Unobtainable". Further research is being carried out, and readers should be reminded of the important work being done by Nancy Atkinson, of Adelaide, and reported in this journal on April 24 and June 5 of this year. In Oxford synthesis of the drug is being attempted. In the meantime we note in the *British Medical Journal* of April 24, 1943, that Mr. Ernest Brown said in the House of Commons that an expert committee was investigating the subject and making clinical trials. It was unlikely that the substance would be available for general use in the near future.

¹ *The British Journal of Tuberculosis and Diseases of the Chest*, January, 1943.

² *Ibidem*.

³ *The British Journal of Experimental Pathology*, Volume X, 1929, page 226.

⁴ *The Lancet*, August 24, 1940, page 226.

¹ *The Lancet*, August 16, 1941.

² *The Lancet*, March 27, 1943, page 387.

Abstracts from Medical Literature.

OPHTHALMOLOGY.

Orbital Emphysema Simulating Cellulitis.

C. L. CONOR O'MALLEY (*The British Journal of Ophthalmology*, May, 1943) describes a case in which an injury to the eye caused signs and symptoms of orbital cellulitis, although the final diagnosis was orbital emphysema. The patient was watching a football game when one of the players collided with him and stuck his finger or fingers into the patient's left eye; slight hæmorrhage from the left eye and the left nostril followed. The eye was closed, but no pain occurred until the third day after the accident. The patient then had to be admitted to hospital in a state of partial collapse and suffering intense pain; his pulse rate was 100 per minute and his temperature was 99.5° F. The general condition suggested an acute infection, in spite of the low temperature. Proptosis of the left eye was present; the eye protruded between the lids, a central belt of cornea being left completely exposed; the lids were stretched tense like a drum. Fleshy folds of chemosed conjunctiva overhung the cornea and projected over the edges of the lids. The eyeball was stony hard. The cornea was opaque and had sloughed at the area of exposure, a large irregular ulcer being present. No intraocular structures could be distinguished and vision was absent. The eyeball was immobile and the orbital tissue felt hard and brawny. No trace of a wound from the intruding finger could be found, and no abnormality was detected in the nose. The patient was given warm saline conjunctival irrigations, atropine and "M & B 693" soluble. The danger to the cornea was realized, and without delay an incision was made under general anaesthesia along the middle third of the upper margin of the orbit. A sinus forceps was pushed through behind the eyeball, and a quantity of gas bubbled up through the blood in the wound. The eyeball immediately subsided into the orbit, the cornea was safely covered by the lids and the tension in all the orbital structures was relieved. The incision was kept open for three days and was then allowed to close. No pus or foul smell was detected, and incubation of material from the depth of the wound produced no growth of organisms except *Staphylococcus albus*, which was thought to be an accidental contaminant. The patient made a steady recovery, although for some days the fate of the cornea seemed to hang in the balance. Visual acuity ultimately was $\frac{1}{20}$, and field and movements were full. Except for adhesions and a small nebula the eye became normal. The author comments that by inference the conclusion is reached that the case was one of orbital emphysema. The air may have penetrated behind the patient's eyeball in two ways: (i) directly through a stab wound made by the injuring finger—this is unlikely; (ii) through a valve-like opening in the orbital plate of the ethmoid sinus made by the injuring finger; this would allow air under pressure to enter the

orbit, but not to leave it. The author favours the second explanation. He remarks that the case was unusual, since orbital emphysema is a rare but not usually serious condition, and requires no treatment except the application of a pressure bandage over the eye.

Multiple Intraocular Foreign Bodies Removed with the Giant Magnet.

R. A. D. CRAWFORD (*The British Journal of Ophthalmology*, May, 1943) reports the case of a man who sought treatment for pieces of steel in his right eye. On examination, the condition of the eye was as follows: (i) the eye was white; (ii) a small perforating wound was present above the centre of the cornea, but the anterior chamber and the iris were normal; (iii) the track of a foreign body could be seen through the lens; (iv) in the vitreous two foreign bodies were to be seen, one, about three millimetres long, lying antero-posteriorly, with one end in the centre of the disk, and the second, a smaller foreign body, at the "6 o'clock" position at the bottom of the vitreous; (v) two minute foreign bodies were seen in the vitreous near the macula, and small dusty vitreous opacities were present; (vi) the retina was slightly oedematous round the disk; (vii) the tension was normal, and visual acuity was $\frac{1}{20}$. The left eye was normal, and visual acuity was $\frac{1}{20}$. The first foreign body was found to be weakly magnetic, so the Haab magnet was used under direct ophthalmoscopic observation. The first foreign body was ultimately removed after three weeks and the second after five weeks' treatment and 28 sessions with the giant magnet, in spite of disappointing results when treatment was first begun. The author comments that however poor the initial response, it is unwise to abandon use of the giant magnet for the removal of small magnetic intraocular foreign bodies until a very prolonged trial has been made. Ophthalmoscopic observation during treatment is of great assistance; the excursion may gradually increase, even if the resting position remains the same for a long period. If observation is impossible, persistence may succeed, though it is much more difficult to decide whether progress is being made. The author does not claim that the result in the case presented is a first-class eye; he considers, however, that less damage was inflicted by the treatment adopted than would have followed the employment of the posterior route.

Contact Lens in Neuroparalytic Keratitis.

M. KLEIN (*The British Journal of Ophthalmology*, May, 1943) presents two cases of neuroparalytic keratitis in which the use of a contact lens was of value. The first patient, as the result of several operations for right-sided acoustic tumour, had right facial palsy and trigeminal anaesthesia. The development of neuroparalytic keratitis of the right eye made tarsorrhaphy necessary, but the condition of the cornea remained unimproved. One year later, although the lids were still sutured, the condition of the eye seemed hopeless. A trial of the therapeutic effect of a contact lens was followed within two or three weeks by a return to whiteness of the eye; the condition of the cornea considerably improved,

although a dense scar remained at the central area. The patient wears the lens for about thirteen and a half hours per day, with a break of about half an hour after the first six hours. The second patient suffered from neuroparalytic keratitis five weeks after alcohol injection for trigeminal neuralgia; two weeks later the area involved extended centrally on a diameter of about seven millimetres. She was given a contact lens, which she wears for about twelve hours a day with a break of one and a half hours at midday. After four months the condition of the cornea had considerably cleared, although a central nebula was still present. Her visual acuity without the contact lens but with correction was $\frac{1}{20}$; with the contact lens it was $\frac{1}{12}$. The author comments that in such cases the anaesthesia of the eye is a slight advantage in the fitting of the lens; the taking of the impression can be accomplished without the use of any anaesthetic agent, and when the lens is put in the reaction of the eye makes it easy to tell whether the fitting is satisfactory, since a wrong fitting causes irritation (hyperæmia, discharge *et cetera*). The use of contact lenses appears justified as an alternative to such a disfiguring procedure as tarsorrhaphy; it gives better protection to the eye, and from the aesthetic point of view it has distinct advantages.

Amaurotic Idiocy.

R. WYBURN-MASON (*The British Journal of Ophthalmology*, April and May, 1943) discusses amaurotic idiocy and presents a number of cases in which the findings were anomalous. He believes that two distinct types of amaurotic idiocy exist, (a) an infantile type and (b) a juvenile type. The infantile type, the author states, is mainly confined to Jews; it is as a rule, but not always, fatal, and it has its onset before the third year of life. Occasionally only optic atrophy occurs instead of the usual macular cherry-red spot; it is probably related to Niemann-Pick's disease. The juvenile type has its onset chiefly about the age of six to eight years, but sometimes as early as the second year of life or as late as the twenties; it occurs mainly in non-Jews, has a slower course, and also occasionally is characterized by optic atrophy instead of pigmentary macular changes, so that the final retinal picture resembles *retinitis pigmentosa*. The juvenile type is genetically and histochemically unrelated to the infantile type, and its relationship to macular heredo-degeneration is doubtful. Often in older patients only cerebral or retinal changes are present.

OTO-RHINO-LARYNGOLOGY.

The Prevention of Ear Disability in Industry.

DAVID A. MCCOY (*The Journal of the American Medical Association*, April 24, 1943) describes a new type of ear stopper, a plastic ear mould, for use among industrial workers exposed to prolonged and repeated loud noises and particularly loud sounds of the high frequency range. He states that the threshold of immediately painful sound varies between 112 and 129 decibels,

depending on the frequency. The higher the frequency, the lower will be the threshold of painful sound. For example, the noise of a revolving aeroplane propeller has an intensity level of approximately 120 decibels. A rivet hammer or a chipping hammer produces sound which may be estimated at 115 to 140 decibels, according to the distance from the hammer at which the noise level is taken. In comparison, conversational speech at 10 to 20 feet varies from 68 to 80 decibels. The effect of the noise on the ear is directly related to the duration of exposure as well as to the distance from the source. The plastic ear mould is a die cast reproduction of a plaster model. As each ear is different, a new plaster cast is made for each stopper. Thus exactness of fit is obtained to eliminate sound leaks and to prevent irritating points of pressure. The writer claims that this new type of ear stopper has the following advantages: (i) it is relatively indestructible; (ii) it is efficient in diminishing intense and high frequency noises, yet permits conversation; (iii) it is a sure block against foreign material; (iv) it is light, transparent and easily cleaned. As an experiment, 30 workers who were exposed to noise in various occupations in the California Shipbuilding Corporation were fitted with ear moulds. The workers included welders, chippers, burners and buffers. After a fortnight they were questioned about the ear moulds, and from their answers the writer thinks the following conclusions are justified: (i) the hazard of loud noise can be eliminated by these plastic ear moulds; (ii) slag burns and foreign bodies involving the ears can be prevented; (iii) elimination of prolonged and repeated exposure to noise is obtained with the resultant eradication of irritative symptoms, which should allow greater concentration on the job and increase of production; (iv) a solution is thus offered for certain industrial ear problems.

The Teleradium Treatment of Intrinsic Cancer of the Larynx.

M. LEDERMAN AND W. A. MILL (*The Journal of Laryngology and Otolaryngology*, November, 1942) state that lesions arising in the true vocal cords, false cords and ventricle, and in the subglottic region are included within the term "intrinsic cancer". Thirty-nine patients treated at the Royal Cancer Hospital, London, during the years 1929-1941 inclusive form the basis of the report. A one-gramme radium unit and a five-gramme radium unit were used for the irradiation. The beam was directed through two small fields 3.5 to 5.0 centimetres in diameter over each thyroid ala, and occasionally also through a third field overlying the *pomum Adami*. As a rule two fields are treated daily for six days, each field receiving 300 to 350 r per treatment. The complete course lasts from four to six weeks, the average tumour dose administered being 6,000 to 7,000 r. It is stressed, however, that no preconceived rule as to dosage is allowed to override clinical considerations. With this object in view daily examination of the patient is considered essential. While some of the patients were considered unsuitable for operation, the condition in a number of them was within the standards of suit-

ability for laryngo-fissure, fenestration or laryngectomy. Of the four suitable for laryngofissure, sterilization of the growth was obtained in all. Of ten suitable for laryngectomy, the disease was eradicated in seven. In ten others, intercurrent disease or advanced age was the reason for no operation. Seven of these patients died with cancer still present; the other three were lost sight of. Three patients were unsuitable even for laryngectomy; one of these is alive and well after eight and a half years. There were nine patients with recurrent cancer, only one being suitable for operation. This last-mentioned patient was well one year after teleradiation. Four patients developed bronchopneumonia and died during treatment. The remaining four were considerably relieved. As a preliminary to treatment, oral sepsis is eradicated and systemic disease, especially anaemia, is brought under control. It is considered best to have the patient in hospital during treatment, especially in the winter months. Preliminary tracheotomy is not advised, as it is considered that the risk of bronchopneumonia is increased thereby and the patient's morale is lessened by performance of the operation. Cases in which tracheotomy is required are as a rule either too advanced or oedema is already present, both militating against ultimate success. Skin reactions rarely caused serious bother, although a routine for treatment of the skin is described. Oedema of the larynx may occur early during treatment and a watch has to be kept for it. Later oedema is less severe and forms part of the normal reaction and may take months to subside. Calcium gluconate has been useful in controlling oedema. Cartilage necrosis occurred in three of the thirty-nine patients treated. It is pointed out that such a reaction may arise early owing to faulty technique, or it may appear many months after treatment owing to *endarteritis obliterans* and is unpredictable but rare. In only two cases was tracheotomy necessary owing to reactions to treatment. Discussing cases with recurrences in which further treatment by irradiation was carried out, the author points out that when previous treatment by irradiation has been given a bad reaction is prone to occur if a further course of intensive therapy is given. If possible, operation is advised in these circumstances, or failing this, palliative irradiation only. For cervical lymph gland metastases a preliminary teleradiation is advised even if surgery is to follow.

Injuries of the Frontal and Ethmoidal Sinuses.

C. A. CALVERT (*The Journal of Laryngology and Otolaryngology*, November, 1942) discusses the likelihood of dural laceration and spread of infection intracranially from the nose. Dural tearing was found twice as commonly in patients suffering from anosmia not explainable by nasal obstruction. Suitably directed X rays may reveal a fracture involving the anterior fossa and displacement of fragments likely to injure the dura. Cerebro-spinal rhinorrhoea and intracranial aerocele are two unequivocal signs of dural rupture. Statistics of the cases forming the basis of discussion support the need for recognition of dural injury and for operative repair by dural suture and

fascial grafts. Of 43 patients with positive evidence of dural tear, twenty were treated conservatively and twenty-three had a dural repair operation. In the former group, nine recovered, eleven developed meningitis or brain abscess and six died. In the group submitted to dural repair, twenty recovered without incident and three died. Only if the patient's general condition is good and when all neuro-surgical facilities are available, should early approach to the dura be made. Usually it is necessary first to allow for recovery from shock and merely to excise the scalp wound and apply sulphanilamide powder. It is not considered wise to wash out blood clots from the nose. Further operation when practicable is carried out under local anaesthesia; foreign bodies and small loose fragments of bone are carefully removed and the wound is then dusted with sulphanilamide and closed without drainage. Subsequently the patient is given adequate dosage of one of the sulphonamide drugs. The patient is warned against blowing the nose. In cases of gross comminution of both walls of the frontal sinuses the dura may be approached after removal of the sinus walls, subsequent drainage being provided into the nose. In many instances when gross injury of the frontal sinus is wanting, approach to the dura is made through a frontal osteoplastic flap above the sinus. Secondary infection of the sinuses was not common in cases of the series under review. A history of preceding chronic sinus infection should, however, be regarded as an indication for early repair of a dural defect.

Ear Block.

I. J. THORNE (*The United States Naval Medical Bulletin*, March, 1943) describes the symptoms arising from obstruction of the Eustachian tube, in compressed air personnel working in caissons, in deep-sea divers and in aviators. As a result of changes in pressure in the atmosphere, equalization of pressure in the Eustachian tube, middle ear and surrounding atmosphere should occur; however, at times, especially when the individual is suffering from a head cold, this may be associated with Eustachian obstruction, and equalization of pressure may not take place. The result is severe pain in the affected ear. Normally yawning and swallowing open the Eustachian tube and allow the necessary changes to take place, but if this does not occur, pain may continue for several days. The condition has been called *aero-otitis media*. The author used two modes of treatment for 306 cases of ear block at the Norfolk Navy Yard, Portsmouth, Virginia. In one method 0.5% "Neo-Synephrine hydrochloride" drops were instilled into each nostril; in the other a mixture of 80% helium and 20% oxygen was inhaled through a nose and mouth mask for three to five minutes. After this the man was placed in the medical compression and decompression chamber, and submitted to a positive pressure of ten pounds. If the ear did not become blocked the man resumed duty; if the ear block recurred he was admitted to sick quarters and given the nasal drops treatment thrice daily. Thorne recorded 92% of cures by means of the helium-oxygen treatment and 42% of cures by the nose drops.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on June 24, 1943, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, Dr. K. S. M. Brown, the President, in the chair. The meeting took the form of a symposium on head injuries.

Head Injuries.

LIEUTENANT-COLONEL K. B. NOAD read a paper entitled "Head Injuries" (see page 141).

DR. E. W. FRECKER read a paper entitled "Notes on the Radiography of Head Injuries" (see page 144).

DR. W. LISTER REID read a paper entitled "Neurosurgical Sequelae of Head Injuries" (see page 146).

SQUADRON LEADER GILBERT PHILLIPS read a paper entitled "Cerebral Concussion" (see page 148).

DR. C. G. McDONALD expressed his appreciation of the papers. Dr. Reid had presented an excellent summary of the many difficulties which the neurosurgeon experienced in the immediate diagnosis and treatment of head injuries, while Squadron Leader Phillips had ably discussed the various theories of concussion. Physicians were, however, not intimately concerned with these questions, because they seldom saw patients suffering from the immediate effects of cerebral injury, except perhaps when on active service. Physicians were called in at a later stage when the patients had failed to make a complete recovery. It was for that reason that Dr. McDonald was especially interested in the paper of Lieutenant-Colonel Noad, which was all-embracing, dealing as it did with the remote as well as the early effects of trauma to the cranial contents. Surgeons were more or less in agreement on the treatment of concussion, fracture of the skull, the various forms of meningeal and intracerebral hemorrhage, gross cerebral sepsis and so on. There was, however, frank disagreement among clinicians as to the nature of the post-concussional syndrome. In the early part of this century, prior to the time of Wilfred Trotter, the majority of physicians and surgeons regarded it as the manifestation of an abnormal psychological condition following head injury. Such patients complained of headaches, often variable in location and described with impressive imagery, of dizziness and of loss of the power of mental concentration. Trotter had protested that these patients only too often were suffering from unresolved cerebral contusions. He described how, even four years after injury, the brain showed "a bruise that appeared as fresh as if it had been inflicted within a few weeks". The inference was that the post-concussional syndrome was dependent on persisting structural changes in the brain. Trotter's views had received strong support in England, in America and on the European continent. Recently, however, there had been a reversion to the older view that the syndrome could be and very often was psychological in origin. In England and in the Middle East attempts had been made to shorten the convalescence of soldiers suffering from cerebral injuries, to get them out of bed as quickly as possible, to reassure them as to the future and to dispatch them as rapidly as possible back to duty. Dr. McDonald understood that this procedure had been generally successful. The remarks which he had made applied only to the sequelae of head injuries in which the symptoms were subjective only and were unassociated with abnormal physical signs. When unilateral signs of damage to the central nervous system existed there could be no doubt as to the organic nature of the lesion. For that reason the examination of the nervous system should invariably be done with meticulous care.

PROFESSOR W. S. DAWSON said that he had been greatly interested in the papers. He had listened to them with considerable envy, because all the speakers kept to fairly firm material ground. The psychiatrist was sometimes faced with the difficult question of assessing the possible results of head injuries. There had been a swing of opinion to and fro regarding the question of possible physical effects and the presence or absence of a true physical cause for disturbances of function following head injuries. It was generally agreed that the more severe cases of reduction of mental activity were comparatively infrequent. Some years earlier Mapother, of London, had produced an exhaustive review of the patients going into mental hospitals and attending psychiatric out-patient departments, and

about 0.4% of cases of major mental disturbance were attributed to head injuries. Among patients attending out-patient departments the figure rose to 0.7%. At the same time, Professor Dawson thought that minor mental disturbances were probably much more frequent—disturbances such as headache, attacks of dizziness *et cetera*. Such complaints had to be considered with regard to the patient's make-up; one had to ask what the patient himself made of them. One point about the more severe mental disturbances was that some moral disturbance might occur; although the patient might appear fairly bright and lucid, a reduction of mentality might have occurred and cause him to be harshly judged. Professor Dawson instanced the case of a man who sustained a severe head injury from which he was considered to have made a good recovery; but when he resumed his occupation, he began to find fault with the manner in which things were done and to complain that the system had been altered during his absence and that nothing was being done properly. Such patients became less responsible and showed some emotional release, although by everyday standards they might appear quite normal; but when it became necessary for them to take some responsibility, they were not up to it. These were points that required close inquiry in certain cases.

DR. B. T. SHALLARD referred to post-traumatic headache. He said that there were a number of cases with a fairly well-defined syndrome characterized by headache and dizziness, accentuated especially on stooping. He had himself had experience of such patients in out-door practice who had been discharged from the army and who could not work on account of their symptoms. In each case there had been a strongly psychopathic family history. Denny-Brown had given an account of a large series of cases of head injuries in the army with post-traumatic headache, amnesia *et cetera*; by removing the patients from hospital as soon as possible and segregating them in rehabilitation centres more than 70% had been returned to duty. The remainder, however, were discharged unfit. Dr. Shallard asked what was their ultimate prognosis—whether it was possible to cure them or whether they should just be considered hopeless neurotic problems.

FLIGHT LIEUTENANT I. D. R. GARDINER said that it should be realized that head injuries were common enough to constitute a problem, since their management was not yet as satisfactory as each speaker had indicated it should be. He suggested that a team should be set up in Sydney, to whom all head injury cases should be referred. It would then be possible to carry out a full investigation and make the results available to all medical practitioners.

Flight Lieutenant Gardiner thought that the idea should be kept in mind as a project to be put in operation fairly quickly.

Squadron Leader Phillips replied to Dr. Shallard's question. He said that there were differences between the sequelae of head injury in the army and in civilian life. In the army, the men were usually healthy and young; they were required to submit to a stiff medical examination before being accepted; then they underwent a course of training calculated to improve their general condition. If they sustained a head injury, they were put in a recovery competition with their fellows. To say that such men presented an homologous result did not impress Squadron Leader Phillips as being related to the more complicated problem of the rehabilitation of civilian patients who had sustained head injuries; in the latter instance, both sexes and all strata of society were involved. Experience under army conditions was precise; but it had no bearing on the problem away from wars. Referring to the question of a psychological or organic basis for post-traumatic symptoms, Squadron Leader Phillips said that it was most refreshing to note how few of the patients related their difficulties to the blow on the head that they had received. But, on the other side of the picture, he asked was it not reasonable now, when an index of altered neuronal activity was available, that electroencephalography should be used. There was the possibility that a person suffering from post-traumatic symptoms might not be submitted to an electroencephalographic examination; he might then be branded as suffering from a purely functional condition and become a miserable appendage to out-patient departments. Squadron Leader Phillips then paid a tribute to Dr. Frecker; he said that he had been impressed with Dr. Frecker's paper. Squadron Leader Phillips hoped that one day there would be available a radiologist who had specialized and could offer himself as a neuroradiologist. There were people who had written books on the subject and had accumulated considerable fortunes. In acute head injuries he thought that radiology gave no help; there was no need to insist

on an X-ray examination unless there was a background of litigation to the case. In chronic post-traumatic states, contrast radiography was in some cases absolutely essential; there was no other way of establishing with certainty that the patient had a cerebral scar. In most cases it was possible to perform a full encephalographic examination with negative results. But in those cases in which a scar was revealed, the patient could be given an excellent prognosis. In conclusion, Squadron Leader Phillips expressed the hope that Dr. Frecker's pious wish would be gratified.

Lieutenant-Colonel Noad, in reply to Dr. Shallard, said that he (Dr. Shallard) must direct his question about the ultimate prognosis to Professor Dawson. As to the immediate prognosis, from the point of view of the army, Lieutenant-Colonel Noad could only reiterate that that depended on the appraisal of the patient. No doubt after head injuries vasomotor disturbances were present, and the good type of man would persist and overcome these disabilities, whereas those who were not so fortunately endowed tended to give up the struggle and their disabilities remained. They usually had to be discharged from the army.

Dr. Frecker said that he personally felt that his receipts for the evening outweighed his expenditure. He was glad that Squadron Leader Phillips approved of his remarks concerning the inclusion of a trained radiologist in the neurosurgical team. A notable example of a radiologist who had achieved eminence in neuroradiology in this manner was Dr. Merrill Sosman, of the Cushing Clinic at Harvard. Referring to the formation of specialized clinics in general, Dr. Frecker said that where there was a special problem and a reasonable amount of related clinical material, then the formation of a special clinic must always be advantageous. If all suitable patients could be collected in one place and investigated and handled by a complete team of competent specialists with sound financial and medical organization, then the quality of the clinical and research work must surely rise. Two problems amongst many that should be dealt with in this manner were cancer and neurosurgery. An excellent beginning in a clinic for the latter had already been made, and it appeared that work would soon commence on a clinic for the treatment of cancer also.

Dr. Lister Reid said that he was in agreement with Squadron Leader Phillips's remarks in support of Dr. Frecker's statements. Most of the skiagrams of the skull and the ventriculograms that Dr. Reid received back from the X-ray department showed the need of such a specialist as a neuroradiologist; it was only the opportunity that was lacking.

Squadron Leader Phillips said that it was difficult to deal with people who had headaches after head injuries, because in war time there was the possibility that they might be trying to avoid military service, and in peace time there was always the question of financial gain from litigation or some such consideration. Such factors caused people to maintain their symptoms of head injury as long as they could. Squadron Leader Phillips was of the opinion that in most cases the cause of the headaches was psychological. But there were a number of people who had a genuine organic cause for their headaches. The first class consisted of those who had a continuously elevated pressure of the cerebro-spinal fluid. They were relieved if they were admitted to hospital for the institution of drainage to reduce the pressure to about 120 millimetres. The second class consisted of those who had adhesions between the dura and the arachnoid in association with the dural sinuses. If there was no litigation in view, these people did well under treatment.

Dr. K. S. M. Brown, from the chair, said that those present were always glad to hear from their colleagues in the armed forces, particularly if they were on active service. They were always able to say something refreshing and new. Dr. Brown was sure that it was gratifying to those who had prepared papers to see such a good audience. On behalf of the Branch, he thanked those who had read papers and taken part in the discussion.

Correspondence.

AN UNUSUAL OPERATIVE FINDING.

SIR: The following is a report of a case which you may consider interesting enough to publish.

A man, G.M., aged forty-five years, was admitted to hospital about 7.30 a.m. on June 16 last with a history of severe abdominal pain and vomiting since 9 p.m. the evening before. He had been quite well that day and had done a hard day's manual work. There was no history of dyspepsia. The pain had been continuous, but was present in spasms on admission. Examination revealed guarding of the whole abdomen with moderate tenderness of maximum intensity to the left of the umbilicus. A soap and water enema produced a little faeces and some mucus. Later, a turpentine enema produced some blood-stained mucus but no faeces. Laparotomy was performed at 1 p.m. through a left paramedian incision. On opening the peritoneum black fluid with a reddish tinge poured out. It had a feculent odour. At least a pint of this was removed by the sucker. A loop of small intestine, moderately dilated, of the same colour as the fluid, could then be seen. The diseased bowel was traced in both directions until healthy bowel was found at the bottom of a confused tangle round the mesentery. The constriction proved to be a loop of sigmoid colon which had strangulated about three-fifths of the small bowel. The constriction was untangled with great difficulty and the mesentery was seen to be thrombosed.

Resection of so much small bowel was considered impossible and the wound was closed. An attempt was made to perform caecostomy, but the distended small bowel was so difficult to pack away that the attempt was abandoned, owing to the patient's low condition. A peritoneal drainage tube was inserted and the grid-iron incision closed. The operation finished at 3 p.m. and the patient died at 5 p.m.

Yours, etc.,

Mossman District Hospital,
North Queensland,
July 21, 1943.

E. MÜLLER.

THE ANNUAL MEETING OF DELEGATES.

SIR: Recent events have proved the value of the annual general meeting of delegates. One would suggest that even more value would obtain if the delegates were given a freer hand in regard to their voting.

Undoubtedly, in rare cases, the direct resolution of the association should be forthcoming in no uncertain voice, but in the great majority of cases, where a delegate's hands are tied to vote affirmative or negative, it would seem that little more advantage is secured by a meeting than would occur from a postal referendum.

It cannot be denied that viewpoints differ in various localities, and how often has one heard a delegate make the statement that, after hearing various speakers, both for and against, he has completely changed his opinion, but, that as he has been instructed by his association to vote in a certain way, he must perforce do so.

One would suggest that, as the delegate should have the complete confidence of his association, much greater value would be gained from our deliberations if the delegate were left more freedom of choice.

Yours, etc.,

ALEX. L. CASELBERG.

South Eastern Medical Association,
Corrimal,
New South Wales.
August 4, 1943.

COMMONWEALTH POWERS, STATE RIGHTS AND THE FEDERAL COUNCIL.

SIR: Your leading article of July 17 upon the report of the Parliamentary Joint Committee deals with matters of fundamental importance.

As you say, it is foolish to cast doubt on the *bona fides* of politicians and to look for ulterior motives. What we must question, however—and in no uncertain manner—is the assumption by members both of the Federal Parliament and of the Federal Council of the British Medical Association that, because they are members of federal bodies, it is their duty to make laws or arrive at decisions which shall have effect for the whole of the Commonwealth, in short, to arrange matters for the whole of Australia.

In the first place, the Commonwealth Parliament under the Constitution has no power to legislate in health matters for the States; yet it is proceeding on the assumption that it has or will have this power! As regards the Federal Council, whilst there is no doubt that the members of the profession

throughout Australia, through their State Councils, approved of the establishment of the Federal Committee, and later of the Federal Council, in order that those bodies could negotiate with the Federal Government upon matters with which the latter is constitutionally entitled to deal, it is equally sure that our members throughout the States and their Councils had no intention of setting up a Federal Council which, by a majority decision, could commit members in one or more of the States to some course or decision to which a majority of those members might be entirely opposed. I entirely disagree with your conclusion that the Federal Council should adopt the view of the majority, and the others should acquiesce in the decision, when this decision relates to fundamental matters of liberty and to State rights in regard to which the Federal Government has, and should have, no jurisdiction.

In no other way, you say, will finality ever be reached. What, may I ask, is finality? Is it uniformity of medical services throughout Australia? And would the next desirable step be uniformity throughout the world? Since when has uniformity been the hall-mark of excellence in matters such as medical services and education? Uniformity in such matters means, generally speaking, bureaucracy and stagnation.

The general trend at present is, of course, towards centralization of power. It is necessary for the conduct of war. But it must not be accepted as desirable in peace-time. It is exactly what we are not fighting for. The true welfare or health of the people of Australia demands that they should hold fast to their State rights. The people of the States through their own governments and councils are perfectly capable of improving their own medical services in accord with their varying conditions and their own desires. That which hinders them is lack of financial power. It must be realized that the "money" through which the Federal Government exercises its coercive power is our money; and sufficient money and consequent power should be made available to the States, so that they may improve their own services with variety and experiment suited to local conditions. That is the path of real progress. It is monstrous that the Commonwealth should use its present financial power to obtain further legal power.

Yours, etc.,

JOHN DALE,
Medical Officer of Health.

Town Hall,
Melbourne,
August 7, 1943.

Obituary.

RICHARD HERBERT JOSEPH FETHERSTON.

THE death of Dr. Richard Herbert Joseph Fetherston, which was reported recently in this journal, brought to a close a career that was remarkable in more ways than one. The son of a father who in his day adorned the ranks of the medical profession and attained eminence as one of its leaders, Richard Herbert Joseph Fetherston followed in his father's footsteps as few men are privileged to do. He attended the sick in general and later in special practice, he served the community in which he lived, he served the nation as head of the medical services in the war of 1914-1918, and he was always in the forefront in the councils of the corporate life of his profession.

To see the life of Richard Herbert Joseph Fetherston in its true perspective it is necessary to recall some facts from the life of his father. The father, Gerald Henry Fetherston, was the son of Gerald Fetherston, sometime medical practitioner at Roscommon, Ireland. He came to Australia, and after serving as resident surgeon to the Lying-in Hospital, Carlton, now the Women's Hospital, he settled in 1865 at Prahran, where he later built a home, "Kiora". Here Richard Fetherston was born, and after his father's death practised for many years. Gerald Henry was health officer to the city of Prahran, a member of the Medical Board of Victoria, and one of the early members of the Medical Society of Victoria and of the Victorian Branch of the British Medical Association. He was for some years honorary treasurer of the Medical Society of Victoria and served a term of office as president. In the military world he was principal medical officer for Victoria and was in charge of Victorian army medical matters during the South African war. Apparently Gerald Henry Fetherston was beloved of his men. It is recorded that when he died and members of the Permanent

Artillery were drawn up at the graveside to fire a salute, several of the men broke down and wept. When the salute was to be fired one man discharged his carbine prematurely while he was raising it to his shoulder, "the wad striking the ear of the man in the front rank, making a regular upset and confusion".

Richard Herbert Joseph Fetherston was born at the Lying-in Hospital, Carlton, while his father was resident surgeon there. He was taken to Prahran by his parents in March, 1865. For six years he went to Miss Templeton's school, The Grange, Toorak Road, South Yarra, and afterwards went to Wesley College and Alma Road Grammar School. He went to Dublin for his medical studies, sailing on the Royal Mail Steamer *Orient* in August, 1881. In the following October he began the winter session at the School of the Royal College of Surgeons. In October, 1883, he went to the medical school at Trinity College, Dublin, and gained his licentiate of the Royal College of Surgeons of Ireland in June, 1884, just two years and eight months after starting medicine, his age being twenty years and one month. As a student he was prosecutor to Professor D. J. Cunningham. After qualification he became a demonstrator of anatomy at the College School. He wished to proceed to the Fellowship of the College, but was refused permission to do so until he was twenty-six years of age. He then went to Edinburgh University in 1885 to obtain a university degree, and twelve months later (an incredibly short time) he obtained the degrees of Bachelor of Medicine and Master of Surgery. Subsequently he was admitted to the degree of Doctor of Medicine on the presentation of a thesis on lacerations of the uterine cervix; the work for the thesis was carried out at the Women's Hospital, Melbourne.

On his return to Australia, Fetherston started practice with his father at Prahran, but very soon accepted a post as resident medical officer of the Women's Hospital. He was in charge when the block of buildings in Gratton Street was built. When he had completed his term of office in 1891 he was elected to the honorary staff of the midwifery department in October of that year. As a matter of fact his father resigned from the staff to make a vacancy for him. He stayed on the staff, passing through all the stages to become full indoor surgeon. He resigned in 1912 when he was appointed to a new position as honorary gynaecologist at the Melbourne Hospital. He retired from the latter position in 1924, having served in an honorary capacity at the two hospitals for thirty-three years. During this period he held university teaching appointments at both hospitals. For several terms of three years he acted as university examiner for the degrees of Bachelor and Doctor of Medicine.

In 1891 Fetherston started practice with his father at Prahran and carried on the practice alone after his father died in 1901. His practice was large and eventually he took a partner, until in 1912 he relinquished the Prahran practice and moved to Collins Street. During his time at Prahran he acted as medical officer of the Blind Asylum, the Deaf and Dumb Asylum and the crèche. He was medical officer to his old school, Wesley College, and he succeeded his father as medical officer to the city of Prahran. Before the last-mentioned event he had stood for election to the Prahran Council and had won three elections, serving on the council for five years. It should be noted that several years later on, after the conclusion of the war of 1914-1918, Fetherston was elected to the Victorian Parliament as representative for Prahran, securing the seat by a majority of 140.

It was in the military sphere that Fetherston's work was perhaps most important. In 1887 he got to know Brigade Surgeon J. Fulton, who was principal medical officer for Victoria. Fulton urged him to take a commission, and he was gazetted captain in July, 1887, on the unattached list of the Victorian Military Forces. At the outbreak of the 1914-1918 war he had attained the rank of lieutenant-colonel. On August 5, 1914, he volunteered for active service. He was soon sent for and was informed that General Bridges wished him to go overseas in charge of the first division. This meant that he would have superseded General Williams and Colonel Charles Ryan, who were both his friends. He said that he would go, but preferred to serve under Ryan. Eventually Ryan was sent. General Williams went overseas and Fetherston found himself appointed Director-General of Medical Services. Colonel Butler's "Official History", the third volume of which was recently reviewed in these pages, has set on record the services of Fetherston to the nation. From the start to the finish the record is marked by thoroughness, by unflinching devotion to duty and by a self-effacement that is most unusual in persons of high rank and station. As Director-General Fetherston had to spend most of his time in Australia. He made two tours of inspection abroad. The first was in 1915. Colonel Butler records that

his rank was "adjusted" just before this journey to ensure his seniority over all officers of the Australian Army Medical Corps abroad, including the Director of Medical Services, Surgeon-General Howse. On his return from abroad he issued on December 3, 1915, a "valedictory" address to the medical service of the Australian Imperial Force in which he urged every member of the service to give loyal aid and support to Howse in order "to maintain a high standard of efficiency and enhance the reputation of our corps". Fetherston, we are told, loyally fulfilled his own exhortation, and this in spite of a "sharp divergence" that is recorded by Colonel Butler. The personal correspondence discloses a "superior" attitude on the part of the overseas officer, but it discloses also "restraint and much forbearance on the part of the home officer". During his second tour in 1918 Fetherston inquired into the position of the heads of the medical services in the allied countries. He subsequently recommended that the Director-General of Medical Services should be directly responsible to the Minister. This recommendation has never been followed. Colonel Butler records the fact that Fetherston served throughout the war as a militia officer on a small "composite" salary. One of the most remarkable facts is that he carried his work to such a peak of efficiency with a ridiculously small staff. Within a few weeks of his return to Australia from his second tour of inspection, Fetherston was retired at his own request. Colonel Butler's tribute reads as follows:

He resolutely declined the honours and rewards which were his by full right and which were offered to him. By an unfortunate discourtesy he was subjected to an unnecessary reduction in rank; but subsequently was placed on the retired list with the rank of Major-General. He left a record of untiring energy and enthusiasm, of absolute impartiality in the difficult task of serving the conflicting demands of the A.I.F. and the Australian nation, and of whole-hearted devotion to duty in the most invidious task laid upon the shoulders of any Australian officer. The future student of Australian history seeking the record of Fetherston's work, should know, when he finds it, that he stands within the very sanctuary of the traditions of the Australian Army Medical Service.

Throughout the whole of his professional life Fetherston was connected with the Medical Society of Victoria and the Victorian Branch of the British Medical Association. He became a member soon after graduation on his return to Australia from overseas. In 1910 he was asked to accept the position of Vice-President. This he did, and in the following year he became President. From then until his death he was a member of the Council of the Branch. For some years he was elected annually, but latterly he was an ex-officio member. It was when he was president that Fetherston went to Sydney to attend a meeting which eventually resulted in the formation of the Federal Committee of the British Medical Association in Australia. With the late George Adlington Syme, he was an original member of this committee, attending the first meeting in 1912, and he remained a member until 1928. In 1935, when the Parent Association held its annual meeting in Melbourne, Fetherston received the signal honour of election as a Vice-President of the Parent Body in recognition of his long and valuable service. The Council of the Victorian Branch has recorded its appreciation of his services in the following resolution:

That the Council of the Victorian Branch of the British Medical Association records with profound regret the death of Richard Herbert Joseph Fetherston, M.D. A member of the Branch since 1888, he was its President in 1911 and its Honorary Librarian from 1935 until his death, and in 1935 was appointed a Vice-President of the association. He rendered signal service to the association in Australia as a member of the Branch Council and the Federal Committee, and as a director of the Australasian Medical Publishing Company, the British Medical Insurance Company of Victoria and the British Medical Agency of Victoria, and was largely responsible for the establishment of those bodies. He was also a trustee of the Medical Society of Victoria and the Branch Income Insurance Fund.

To the people of Australia he gave many years of work of the highest quality both in his capacity as a private medical practitioner, as Medical Officer of Health to the City of Prahran and as Director-General of Medical Services in the war of 1914-1918.

The Council expresses its sympathy to his family.

From its earliest days Fetherston was associated with the Australasian Medical Publishing Company, Limited,

which controls this journal. He was an original member of the company and became a director in 1917. He acted as director for one year when he retired and was succeeded by the late Wilfrid Kent Hughes. In the year 1929, on the retirement of Kent Hughes, Fetherston was again persuaded to join the Board of Directors. He remained a director until 1938, and when he retired the directors placed on record their appreciation of his many years of service.

Among the other spheres of activity in which Fetherston "laboured abundantly" for his profession are those named in the Victorian Branch Council's resolution. But his activities extended far beyond the official organizations of the profession. Those who are best qualified to speak on the subject have written of his kindness, help and sound advice which were available to his colleagues whenever they were needed. He was always ready to help the younger men, particularly in the early days of their practice. His help was given in a personal way, without any publicity (for he shunned it always) and with no thought of personal gain. Of Richard Herbert Joseph Fetherston it may be said that he followed the path of duty as he saw it without fear or favour and that he left an example of professional rectitude and personal honour.

Dr. R. C. BROWN writes:

The sudden death of R. H. Fetherston must have caused a twinge of sharp regret to many in the Prahran municipality where he and his father, of whose memory he was very proud, had been leading personalities for so long. They both specialized in obstetrics and gynaecology and became individual figures in many families.

The son was more a man of the people than a student and held a number of public offices. He represented Prahran in Parliament, was a municipal councillor, a justice of the peace, and was an energetic health officer till the end of his life. In addition he was always interested in military matters—finally ranking as general.

Professionally he was at one time President of the Victorian Branch of the British Medical Association, and all his life held other offices of trust and importance in the association. The nursing profession also benefited by his goodwill.

He was wise, shrewd and kind, of a very equable temperament and quite imperturbable.

I often had occasion to find that he could be and was a very good friend, and his cool, thoughtful advice to be invaluable in a crisis such as comes to most of us at times.

Altogether Fetherston's passing will leave a permanent gap in many lives.

PERCY GLOVER COOLEY.

We are indebted to Dr. John R. Broome for the following appreciation of the late Dr. Percy Glover Cooley:

With the passing of Percy Glover Cooley, Sydney has lost one of its oldest and best known practitioners. Starting in practice in Redfern as a young man, he continued there until comparatively recently, when he gave up his suburban practice and continued his work from rooms in Macquarie Street.

He was always a conscientious doctor and an able and careful surgeon. He was a man to whom the interests of his patients always came first and throughout his long career he endeared himself to thousands. Since he was forced to relinquish practice a few weeks ago, I have seen a number of his patients whom he had attended for periods of forty to forty-five years, and who had never consulted another doctor. In many cases he has attended parents, children and grandchildren, and his old patients of the Redfern days still returned from all corners of the State to consult him.

I am sure that no better example of the family practitioner, dear to both his patients and his friends, could be found than Percy Cooley.

The death of his son, Major Geoffrey Cooley, a brilliant young graduate of Sydney University and a F.R.C.S. of England, on the hospital ship *Centaur* was a heavy blow to Dr. Cooley from which he did not recover.

LAWRENCE RUTH FORBES.

We regret to announce the death of Dr. Lawrence Ruth Forbes, which occurred on June 11, 1943, at Rockhampton, Queensland.

LEWIS LOFKOVITZ.

We regret to announce the death of Dr. Lewis Lofkovitz, which occurred on July 1, 1943, at Blackall, Queensland.

BENJAMIN GILMORE WILSON.

We regret to announce the death of Dr. Benjamin Gilmore Wilson, which occurred on August 13, 1943, at Ipswich, Queensland.

Notice.

A MEETING of the obstetric staff of the Queen Victoria Hospital, Mint Place, Melbourne, will be held at the hospital at 8.15 p.m. on Wednesday, August 25, 1943. Dr. Kate Campbell will speak on "The Recent Epidemic of Gastroenteritis Neonatorum". All members of the British Medical Association are invited to attend the meeting.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Inglis, William, M.B., B.S., 1943 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.
Newton, Noel Curtiss, M.B., B.S., 1941 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Davis, Harold Lewis, M.B., B.S., 1943 (Univ. Sydney), The Crescent, Pennant Hills.
Diethelm, Basil, M.B., B.S., 1940 (Univ. Sydney), 185, Macquarie Street, Sydney.
Hobson, David Lennox, M.B., B.S., 1943 (Univ. Sydney), Mater Misericordiae Hospital, Pacific Highway, North Sydney.
Hunter, John Michael, M.B., B.S., 1943 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.
Kerridge, John Charters, M.B., B.S., 1942 (Univ. Sydney), 50, Cheltenham Avenue, Cheltenham.
Knox, John Wallace, M.B., B.S., 1943 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Milgate, Leslie Thomas, M.B., B.S., 1943 (Univ. Sydney), Sydney Hospital, Sydney.
Mocatta, Frances Arkell, M.B., B.S., 1943 (Univ. Sydney), Rachel Forster Hospital, 150, Pitt Street, Redfern.
Orr, Robert Hargreaves, M.B., 1943 (Univ. Sydney), Royal Prince Alfred Hospital, Missenden Road, Camperdown.
Smith, Margaret Helen, M.B., B.S., 1943 (Univ. Sydney), St. George District Hospital, Kogarah.

Books Received.

"Infant Feeding in General Practice", by J. Vernon Braithwaite, M.D., F.R.C.P., with a foreword by H. C. Cameron, M.A., M.D., F.R.C.P.; Second Edition; 1942. Bristol: John Wright and Sons Limited; London: Simpkin Marshall (1941) Limited. 7½" x 5", pp. 176. Price: 7s. 6d. net.

"Psychopathology: A Survey of Modern Approaches", by J. Ernest Nicole, L.M.S.S.A., D.P.M.R.C.P. and S.; Third Edition, Revised and Enlarged; 1942. London: Baillière, Tindall and Cox. 8½" x 5½", pp. 276. Price: 15s.

"Textbook of Midwifery", by Wilfred Shaw, M.A., M.D., F.R.C.S., F.R.C.O.G.; 1943. London: J. and A. Churchill, Limited. 9" x 5½", pp. 601, with 246 illustrations. Price: 21s.

"Cabot and Adams Physical Diagnosis"; Thirteenth Edition by F. Denette Adams, M.D.; 1942. London: Baillière, Tindall and Cox. 9½" x 6", pp. 993, with 399 figures. Price: 27s. 6d.

"The Physiological Basis of Medical Practice: A University of Toronto Text in Applied Physiology", by Charles Herbert Best, M.A., M.D., D.Sc., F.R.S., F.R.C.P. (Canada), and Norman Burke Taylor, M.D., F.R.S. (Canada), F.R.C.S. (Edinburgh), F.R.C.P. (Canada), M.R.C.S. (England), L.R.C.P. (London); Third Edition; 1943. Baltimore: The Williams and Wilkins Company. 9½" x 6", pp. 1958, with 497 figures. Price: \$10.00.

Diary for the Month.

- AUG. 23.—Federal Council of the B.M.A. in Australia: Meeting at Melbourne.
AUG. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
AUG. 25.—Victorian Branch, B.M.A.: Council.
AUG. 26.—New South Wales Branch, B.M.A.: Branch.
AUG. 27.—Queensland Branch, B.M.A.: Council.
SEPT. 1.—Victorian Branch, B.M.A.: Branch.
SEPT. 1.—Western Australian Branch, B.M.A.: Council.
SEPT. 2.—New South Wales Branch, B.M.A.: Special Groups Committee.
SEPT. 2.—South Australian Branch, B.M.A.: Council.
SEPT. 3.—Queensland Branch, B.M.A.: Branch (Jackson Lecture).
SEPT. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
SEPT. 10.—Queensland Branch, B.M.A.: Council.
SEPT. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
SEPT. 14.—Tasmanian Branch, B.M.A.: Branch.
SEPT. 15.—Western Australian Branch, B.M.A.: Branch.
SEPT. 21.—New South Wales Branch, B.M.A.: Ethics Committee.
SEPT. 22.—Victorian Branch, B.M.A.: Council.
SEPT. 23.—New South Wales Branch, B.M.A.: Clinical Meeting.
SEPT. 24.—Queensland Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmains United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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The Committee invite applications from legally qualified Medical Practitioners, up to 12 noon on Wednesday, 25th August, for the position of Acting Honorary Dermatologist to the Hospital. The period of appointment is for six months.

Applications must be submitted on forms obtainable from the undersigned.

By order.

H. BARRETT,

Manager and Secretary.
Carlton, N.3,
12th August, 1943.

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The Committee invite applications, with testimonials, from legally qualified medical practitioners, for the position of Medical Superintendent to the Hospital.

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The appointment is subject to the approval of the State Medical Co-ordination Committee of Victoria.

By order.

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Manager and Secretary.
Carlton, N.3,
16th August, 1943.

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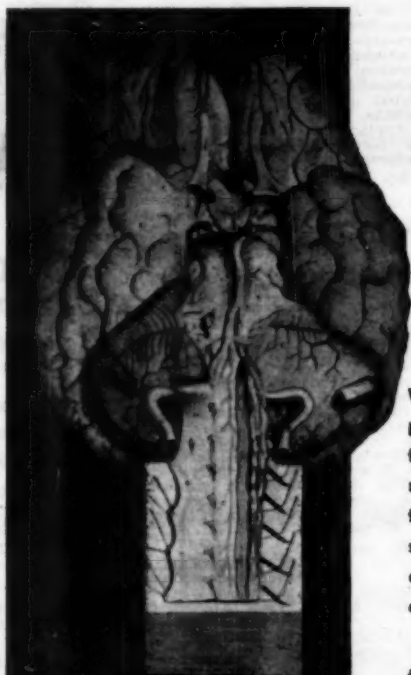
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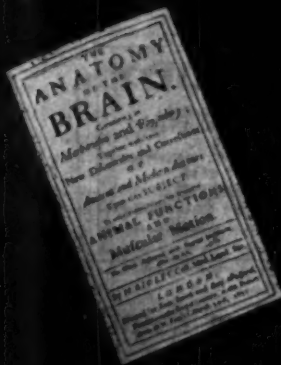
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1. Council Report: J.A.M.A., 113: 1734, 1939
2. Merritt, H. H. & Putnam, T. J.: A. J. Psychiat., 96: 1023, 1940

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